DEPARTMENT OF THE ENVIRONMENT
ENVIRONMENTAL PROTECTION SERVICE
ECOLOGICAL PROTECTION GROUP

AN ENVIRONMENTAL OVERVIEW OF POTENTIAL SITES FOR A COAL LOADING TERMINAL ON VANCOUVER ISLAND

BY

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EXECUTIVE SUMMARY

The purpose of this overview is to present relevant available data and provide a profile that can be used to familiarize the reader with proposed Coal Port sites on Vancouver Island. The information is not meant to select or reject any specific sites, however, in several cases there are restrictive conditions that support rejection and these are highlighted.

Coal port evaluation depends on several criteria including engineering, environmental, socio-economic, navigational, and transportation perspectives.

Environmental concerns exist in air and water pollution via fugitive dust, as well as the destruction of habitat or potential destruction due to spillage of cargo or fuel oils.

Engineering concerns include planned or proposed uses of sites, transportation links required, servicing requirements, soil and bedrock conditions, break water construction, dredging and site improvement costs.

Navigational criteria include the effect of wind and seastate on berthing and transfer operations and navigational hazards such as rocks, shoals and water routes.

Transport refers to the distance and safety of moving cargo from the site, the number of railway/road and road/road crossings, noise, exhaust, and fugitive dust. Along with increased traffic is the degradation of road surfaces and congestion of thoroughfares.

Socio-economic values include present land use in regards to natural, agricultural, recreation, aesthetic and potential upland use.

In general those sites with extensive shallow shores, difficult steep access, productive estuaries or long distances from coal sources or rail road links would be candidates for exclusion. The following sites were examined, Bamberton, Hatch Point, Kulleet Bay, Union Bay, Oyster Bay, Campbell River (Middle Point) and Port Alberni (Stamp Point, River Point).

Bamberton which is located on the Saanich Inlet is a non operating cement plant which has deep sea berths, conveyors and storage sites which could be converted to coal transport with little capital cost. Although there is little available environmental data the region is highly valued for its marine pleasure boating, fishing and salmon rearing. At least six species of marine mammals and numerous species of marine birds are known to frequent the waters of the inlet. There is no rail link and the area is accessed via a road from the main highway down a steep grade.

Hatch point is located 20 km south of Duncan in an industrual zoned area that was once used for shipment of copper concentrate and later gravel. The available site is presently being converted to an oil offloading terminal by Chevron Canada Ltd. which would likely preclude the use for a coal terminal.

Kulleet Bay is located in the Chemainus Indian Reserve and has protected shallow waters that would require 150,000 DWT ships to berth 200 m offshore. It is a major wintering area for water fowl and spawning area for herring, squid, and groundfish. There is no direct road or rail access.

Union Bay is located 12.5 km south of Courtenay and adjacent to Highway 19 and the Esquimalt and Nanaimo Railway. It was previously used as a coal loading facility in 1959. The shoals of Bayes Sound would be a hazard to navigation and 150,000 DWT vessels would have to berth 335 m from shore and Panamax class vessels (60,000 DWT) could berth 150 m away. Coal dust problems could result from high winds although there is limited residential use of the area. Hart Creek a salmon spawning stream flows through the area and there are commercial fisheries of salmon, ground and shellfish in the area. This region has a moderately high recreation potential.

Oyster Bay is located 14.5 km south of Campbell River and has been designated for future port expansion however shallow waters would restrict berthing to further than 300 to 550 m offshore. There are extensive eel grass beds which support communities of clams and shrimp.

There is a high level of sport fishing activity and commercial trawling offshore. Any loading facilities would be highly visible from the highway.

Middle Point is located 8 km north of Campbell River and 50 km north of the nearest railhead at Courtney. The point is a 250 m lava outcropping into Discovery Passage and is favoured as a site by the Quinsam Coal Company as it is only about 20 km from its' coal property southwest of Campbell River. The area has a productive capacity for ungulates and is rated as moderate for recreational use. The City of Campbell River has designated the site for port development but navigational hazards would limit traffic to barges only and would not serve as a deep sea coal handling facility.

The Stamp Point site is on the west side of the Port Alberni Harbour and although extensive rock blasting is required to provide area for a loading facility no wind or current protection is needed. Navigational hazards would restrict the access to Panamax size vessels and daytime travel only. At the head of the inlet, three km from the site, is the Somass River and estuary which supports all five species of Pacific Salmon, cutthroat trout, steelhead trout and related sport and commercial fishery. There is a high developmental cost associated with this site due to difficulty of access and distance from the coal fields.

River Point is also on the Alberni Inlet 15 km south of Port Alberni on the south side of the Franklin River Estuary. The estuary is rated as highly productive for the salmon fishery and is likely to be affected by the dredging and filling operations required for a port. The high cost of access construction for coal transport and the location on the estuary would support exclusion from further consideration.

1.0 INTRODUCTION

1.1 Background

"King" coal as it has been known in the past was the dominant energy source at the turn of the century. With the discovery of large petroleum reserves coal's predominance began to decrease and fell from 49% in 1940 to 29% in 1973 (U.S. Department of Energy, 1981). In response to increasing oil and gas costs and the unpredictability of their supply, world demand for coal has increased since the mid-1970's. This trend will continue despite the short-term decrease in demand due to the world recession. In fact, it is estimated that, during the next twenty years, coal will provide one-half to two-thirds of the additional fuel needed by the world, with some countries in the Asia-Pacific region planning to double or triple coal use by the year 2000 (Siddiqi et al, 1983).

The coal industry on Vancouver Island has a history that has been much influenced by global level energy use trends and consequently has gone through many changes. At one time, coal loading facilities existed at Nanaimo, Boat and Ladysmith Harbours. Coal piles can be still seen at Union Bay where there was also a coal shipment facility.

Currently there are two proposals for coal projects before provincial and federal regulatory review agencies, the Quinsam Coal Project in Campbell River area and the Wolf Mountain Coal Project in the Nanaimo area. Both projects have undertaken studies to identify the most appropriate sites to develop port facilities for coal shipment, in those areas.

It is with the potential of increased island coal development, proliferation of coal port sites and corresponding potential environmental impact that this study has been initiated.

Hopefully this study will stimulate discussion at the provincial and federal levels regarding an island coal development policy and the need to evaluate coal proposals and coal port sites systematically and within a broader policy framework.

1.2 Terms of Reference

On February 4, 1983, Mr. John Millen of the federal Environmental Protection Service authorized Environmental Project Consulting to proceed with an overview of environmental features at eight selected potential coal port sites on Vancouver Island. The sites considered are:

Bamberton
Hatch Point
Kulleet Bay
Union Bay
Oyster Bay
Campbell River: Middle Point
Port Alberni: Stamp Point
River Point

The general location of these sites is shown in Figure 1. The design facilitiy is to handle two million tons/year and berth vessels up to 150,000 DWT in most cases and Panamax sized vessles (60,000 DWT) in the remainder.

A list of criteria to evaluate coal terminal sites is to be developed.

The above tasks are to be undertaken using existing text and map information.

1.3 Study Approach

At the outset of this study, a computer search of titles related to coal port development was done. The relevant titles were reviewed to establish the evaluation criteria.

Several reports and project applications held by the Environmental Protection Service in Vancouver and the Assessment Branch of the Ministry of Environment in Victoria were reviewed for information relevant to the designated port sites.

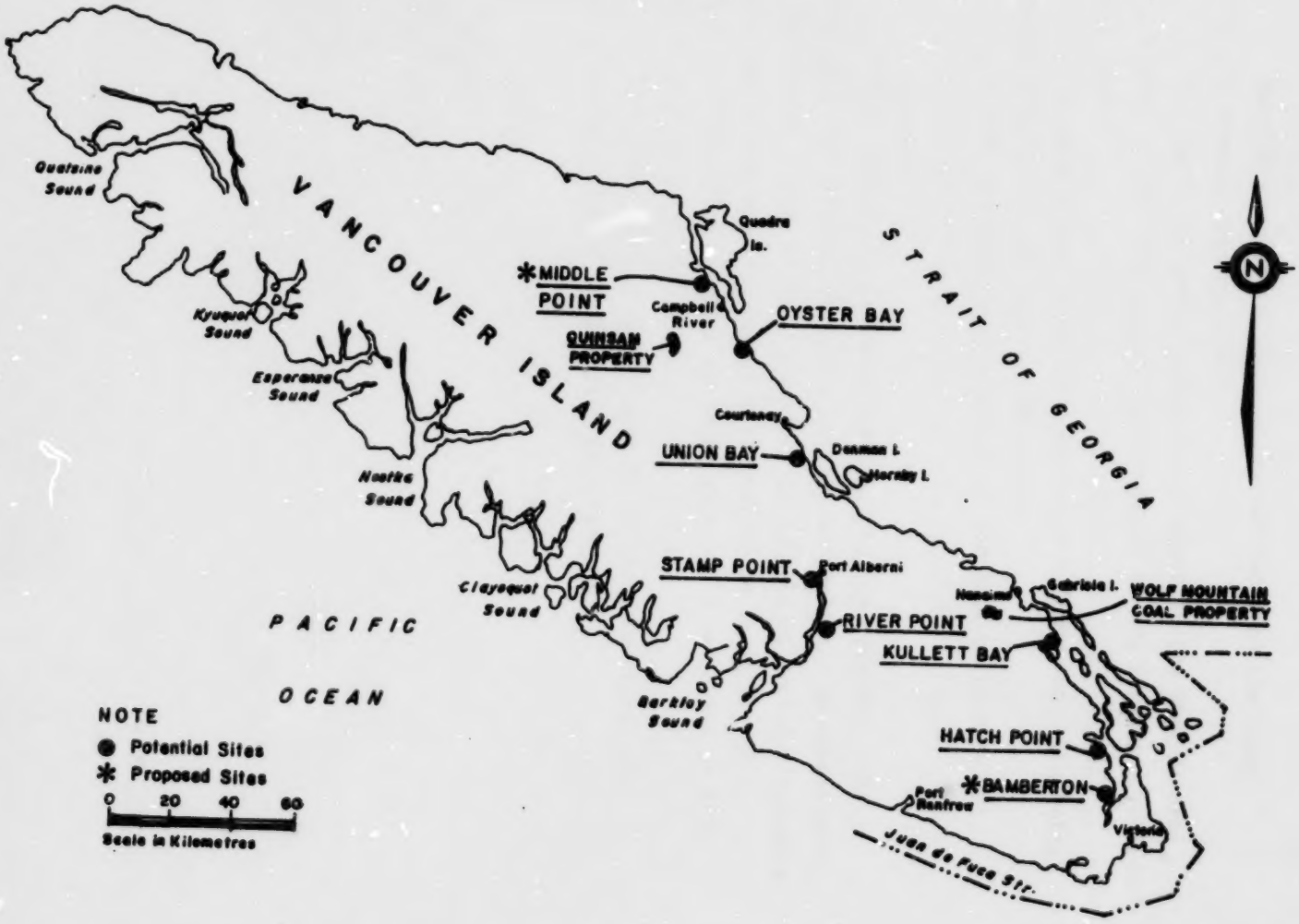


FIGURE I PROPOSED AND POTENTIAL COAL PORT SITES

Much of the map information was derived from the Lands Directorate Coastal Resources Folio.

All the sites were visited except those in the Port Alberni area. Plates of the sites as well as airphotos of the sites are included in this report.

For some sites, there is a dearth of information, this being reflected both in the text and on the maps.

A list of contacts is appended at the back of this report.

1.4 Contents

This report is, as the title suggests, an overview. The material has been abstracted from a variety of sources. An operational goal during the course of this study was to compile as much environmental information on the sites as possible to provide an inventory of information from which if required, more detailed assessments or site selection studies could be based.

This introduction is followed by two main sections, coal terminal siting criteria and the site descriptions.

2.0 COAL TERMINAL SITING CRITERIA

2.1 General

The main purpose of this part of the report is to review criteria that have been used for siting coal terminals and to develop a generic set of criteria that could be used for siting future coal terminal facilities on Vancouver Island. These same criteria should be general enough to have universal application for potential coal ports anywhere.

The emphasis of this section will be on environmentally related criteria.

There are two main areas of knowledge that can be drawn upon to develop coal terminal siting criteria. There is that which is associated with siting ports in general, there is documentation associated with coal terminal development specifically and there is documentation on the environmental impacts of coal transportation.

In terms of evaluating sites, criteria can generally be categorized as either inclusion or exclusion criteria. An example of an inclusion criterion is sites with a depth of ten fathoms are included and an exclusion criterion example is all sites within estuaries are excluded. Inclusion criteria tend to relate to factors which would also determine engineering, navigation and consequently economic feasibility. Exclusion criteria tend to relate to features that could be impacted.

Since the sixties, there has been a body of knowledge developed in siting energy facilities such as nuclear plants and liquified natural gas facilities. The art and science of siting energy facilites can be drawn upon to facilitate selection of coal terminal sites. The analytical nature of different approaches varies from purely qualitative non-numerical comparisons to sophisticated multi-variate decision analysis models. Readers interested in knowning more about the siting process are referred to Siting Energy Facilities by R.L. Keeney (1980).

2.2 Past Experience

There are several perspectives that can be taken when establishing criteria to evaluate potential coal terminals, including engineering, environmental, socio-economic, navigational and economic perspectives. Other factors affecting the criteria seletion are the size and nature of the coal development in terms of necessary land needed for facilities, size of stock pile, form of transportation to site (truck, train, pipeline), form of transportation from site (barge, size of ship), etc.

Environmental criteria are generally related to the potential effects coal terminal development may have on the site or the limiting effects the environment may have on the terminal such as seastate, depth of approach, weather, etc.

The main environmental impacts that were of concern during the Roberts Bank Port Expansion hearings were impacts on the habitats of salmonids, crabs and waterfowl (FEARO, 1979). The main social issues were impacts of train noise and the possible use of B.C. Harbours Board lands behind the dykes for port related industrial development.

In an investigation of eleven prospective coal terminal sites along the coast of North Carolina the following criteria were used (Cribbin, 1981):

- acreage
- land use
- rail access
- access to open water
- proximity to channel
- channel depth
- highway access
- environmental sensitivity
- archaeological or historical site
- competing energy use
- permittability

A study by Bertram et al, (1980), identified the following environmental concerns associated with coal transportation:

Rail

- Air quality (diesel emissions, fugitive dust)
- Noise
- Community disruption
- Habitat destruction (construction)
- Safety (accidents)
- Coal storage (dust and fires)

Roads (local and secondary)

- Air quality (fugitive dust and diesel emissions)
- Water availability
- Changed land use
- Noise
- Traffic congestion and safety
- Degradation of roads
- Coal storage (dust and fires)

Barge

- Water quality
- Dredge spoil disposal
- Sedimentation
- Air quality (vessel and dredging emissions)
- Shoreline erosion
- Habitat destruction (dredging)

The main impacts associated with different transportation technologies are:

Rail - with an increase in railway crossings there are safety and traffic distruption impacts. The impact being dependent on the number of trains per day, average length, speed and percent of crossings which are blocked.

Roads - The main concerns with increased truck use of roads are the potential for increased accidents and the damage to road surfaces.

Barge - dredging is the main impact from the development of barge transport of coal.

In 1974, a paper (Wolferstan, 1974) was prepared for the Environment Land Use Committee Secretariat on potential port industrial sites on south-east Vancouver Island. The emphasis in the report was to identify sites capable of shipping forest products. The criteria which were used in this evaluation were:

- depths
- maximum amount of dredging required
- degree of shelter from prevailing winds
- breakwater construction required
- tide range
- currents
- turning radius
- congestion
- back-up land available
- fish values
- marine resources
- wildlife values
- agricultural values
- recreation values
- aesthetic values
- present land use
- potential upland use
- major upland impacts

Criteria which were included in the paper for consideration but not assessed within the report were:

- social impacts
- land status and ownership
- local zoning concepts, regional plans
- planned or proposed uses
- transportation links required (road/rail)
- servicing requirements
- soil and bedrock conditions
- site improvement costs

The Harmac South site was identified as the best site but was precluded from port development due to other proposed uses by the owners of the property. Duke Point which was the second best of ten sites was ultimately developed as a port-industrial site.

Swan Wooster, (1978) prepared an evaluation of alternative coal terminal sites in the Campbell River area for Quinsam Coal. The evaluation considered a range of ship sizes from 20,000 DWT to 100,000 DWT, a terminal capacity of 1,000,000 tons throughput per year and a stockpile of 50,000 tons. Wind, wave, tide and current information was reviewed. Several of the potential sites were screened using factors such as haul distance, topography, and seastate. Four sites were investigated more thoroughly mainly because they had the correct zoning, the land was available and the physical features were appropriate. The four sites were then described in terms of land use, topography, foundation conditions, navigation, weather, wave, tides, currents, environmental and planning considerations and services. Then capital costs were estimated for the different sized ships that were recommended for the different sites. Factors expressly not considered were onshore vehicle access routes, cost of land and/or leases, security of tenure, environmental or social issues and government policy decisions. In terms of comparing the sites, the two

yardsticks established were ship accessibility and capital costs. After this work was completed, Quinsam Coal chose the site that was documented as having the lowest capital cost but the greatest probable environmental impact. Subsequent to that selection, and because of local opposition to the selection, another site was chosen.

2.3 Criteria Checklist

The previous section illustrates that there are several different criteria that can be used to evaluate port sites and more specifically coal terminal sites. Generally most site evaluations have not been set up in a comprehensive manner which incorporate all parts of a coal transportation concept and which will allow a systematic comparison of the sites.

For any coal terminal concept, there are three main sub-systems; the transportation delivery sub-system which brings the coal to port; the terminal facilities sub-system where coal is stored and loaded; and the port and harbour sub-system including the ships that use it (U.S. Department of Energy, 1981). These sub-systems should all be included in a site evaluation.

The checklist provided below is by no means exhaustive and comprehensive. Some of the criteria are easily measured in terms of distances, areas or costs and some are less easily measured such as disturbance to marine mammals. Ideally, comparative site evaluations should consider socio-econimic, health and safety as well as environmental and economic concerns. The criteria below deal only with environmental concerns, and economic concerns as they relate to engineering and environmental limitations. How criteria are used ultimately depends on the method of analysis and comparison chosen.

Transportation Delivery

Distance of site from deposit
Distance from other potential coal developments

Transportation Delivery (continued)

Availability and capacity of rail
Amount of up-grading required
Amount of new rail required
Availability and capacity of roads
Cost of rail construction/operation
Cost of road construction/operation
Number of road crossings for rail
Number of road crossing to road
Hectares of Class 1 and 2 wildlife, agricultural and recreational land pre-empted
Proximity of corridor to ecological reserves, wildlife refuges, or other special designated areas
Number of stream-crossings required by either rail or road construction
Salmon escapement of streams to be crossed
Limiting topography for rail and road construction
Proximity of corridor to critical habitat for ungulates, waterfowl, raptors, fisheries
Proximity of corridor to rare or endangered flora or fauna or remnant ecosystems
Proximity to hazardous lands such as avalanche slopes

Terminal

Amount of developable land
Cost of site improvement
On-shore foundation
Marine foundation material conditions
Proximity to rail
Availability of services; power, water sewage
Cost of land and/or leases

Terminal (continued)

Current land use zoning/proximity to conflicting industrial land use
Present and potential land use
Cost for construction/operation
Amount of dredging required
Nature of sea bed
Requirement of breakwater
Potential Seismic problems
Depth
Currents, waves, tides
Wind speed and direction
Degree of shelter from winds
Adequate turning radius
Presence of navigational hazards
Suitable anchorage sites
Potential tsunami problems
Area of eelgrass beds destroyed
Presence and number of waterfowl, seabirds
Presence and number of marine mammals
Criticalness of wildlife habitat
Important habitat for fisheries
Presence of unique or endangered flora or fauna
Location for dredge spoil
Presence of estuary or tidal marshes
Resource harvesting activities - commercial, recreational, domestic
Presence and proximity of ecological reserves, wildlife refuge, parks, sanctuaries or other specially designated areas
Erosion problem from waves from ships or barges
Potential groundwater and surface water problems from stockpile

Shipping

Length of route to destination
Length of time to destination and operational costs
Shipping traffic - quantity, type
Navigational hazards
Weather and seastate constraints
Potential accidents per year
Interference with resource harvesting - commercial, recreational, domestic
Disturbance to marine mammals
Potential effects of fuel oil spill on birds, mammals, fisheries on approach route

3.0 SITE DESCRIPTIONS

3.1 General

This section contains a description of the eight sites mentioned in the Terms of Reference. Although the emphasis is on an environmental description, other pertinent descriptive information has been included. Much of the environmental information is on the maps which have been interspersed between the text.

3.2 Bamberton

The site is on Saanich Inlet at a non operating cement plant which has deep sea berths and conveyors suitable for loading ships or barges. Figure 2 shows its location and Plates 1 and 2 illustrate the site configuration. Plate 3 is an airphoto of the area.

As far as it is known, there have been no detailed environmental studies done at this site. Some overview information was compiled by the Wolf Mountain Coal Project (1982) for their submission to the British Columbia Ministry of Energy, Mines and Petroleum Resources. The following section is a summary of the pertinent information. No environmental maps have been prepared for this site due to the dearth of information. There is little shallow or estuarine water near the Bamberton site and consequently there is a minimal amount of marine habitat that would be sensative to such activity. The shore and upland have severe limitations due to the steep topography. In the general Saanich Inlet area, the harbour seal is the only resident marine mammal and has been sighted in groups as large as 24 on Boatswain Bank, north of the Bamberton site. Around the mouth of the inlet are northern elephant seals, killer whales, harbour porpoises and solitary minke whales.

The area around Bamberton has important fisheries value being used for rearing and feeding by juvenile and adult salmon, coho, chum and chinook.

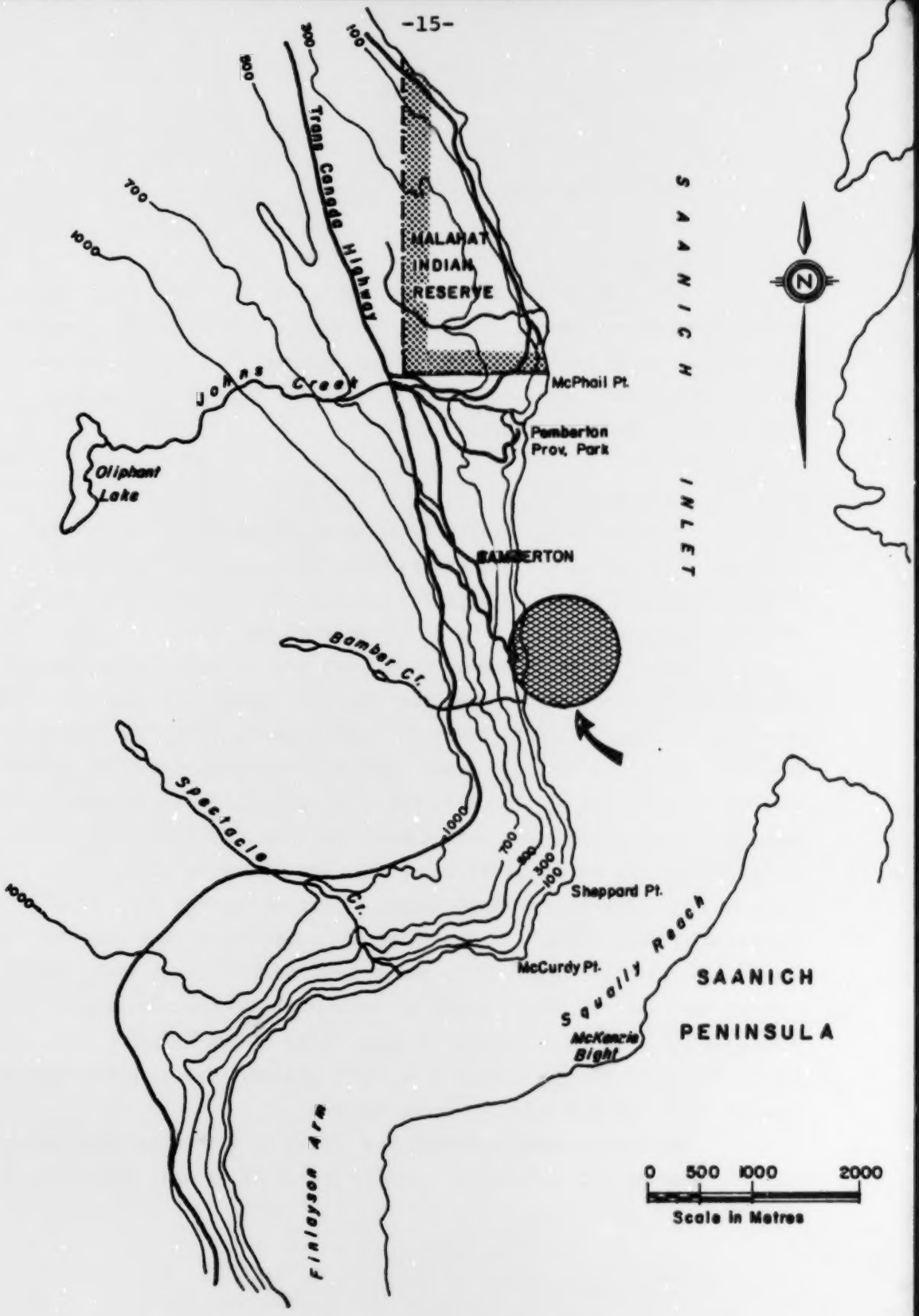


FIGURE 2 BAMBERTON SITE

PLATE 1 BAMBERTON SITE - Ocean Cement Site

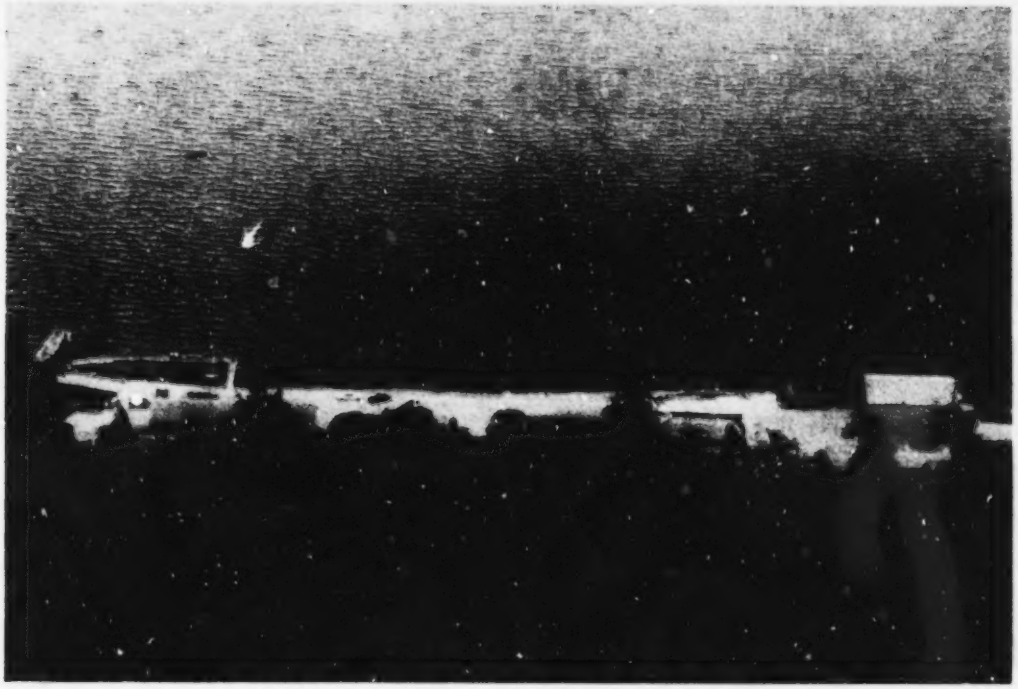


PLATE 2 DOCK AT BAMBERTON SITE

PLATE 3 AIRPHOTO OF BAMBERTON SITE
(30 BCC 248 0049)

The Saanich Inlet has been claimed to be one of the finest recreational areas in B.C. It is used extensively for boating and fishing. There is a provincial park two kilometers north of the site. During the winter months, a commercial prawn fishery is operated.

On various surveys, from Mill Bay to Bamberton, from 1976-1980, wigeon, dabblers, scaup, bufflehead, merganser, grebes, cormorants, herons, eagles, and gulls have been observed.

Highway access from the Nanaimo direction requires a left at a currently uncontrolled intersection.

Approximately 30,000 tonnes of coal can be stored on site and the site, with few modifications and little capital cost, could be easily converted from its current cement orientation to coal.

3.3 Hatch Point

Hatch Point is 11.5 km south of Cowichan Bay and 20 km south east of Duncan. The site and foreshore has been zoned industrial. The site was used at one time for storage and shipping of copper concentrate and then subsequently gravel transport. Railway access is approximately five kilometers away and the No. 19 Highway is three kilometers away.

Boatswain Bank is a navigational hazard. The site is well protected from the prvailing westerly and east-south-easterly winds.

In general, because Hatch Point is on Saanich Inlet (Figure 3), many of the comments made about Bamberton apply to Hatch Point. Its proximity to Boatswain Bank and Cowichan Bay increase its environmental value due to the greater number of waterfowl, seabirds and fisheries associated with these two areas.

Chevron Canada Ltd., has constructed oil storage tanks on the upland and by September, will have oil off-loading facilities constructed where the copper loading facilities were, at one time, located. The configuration of the facilities on March 4, 1982 are shown on Plates 4 and 5.

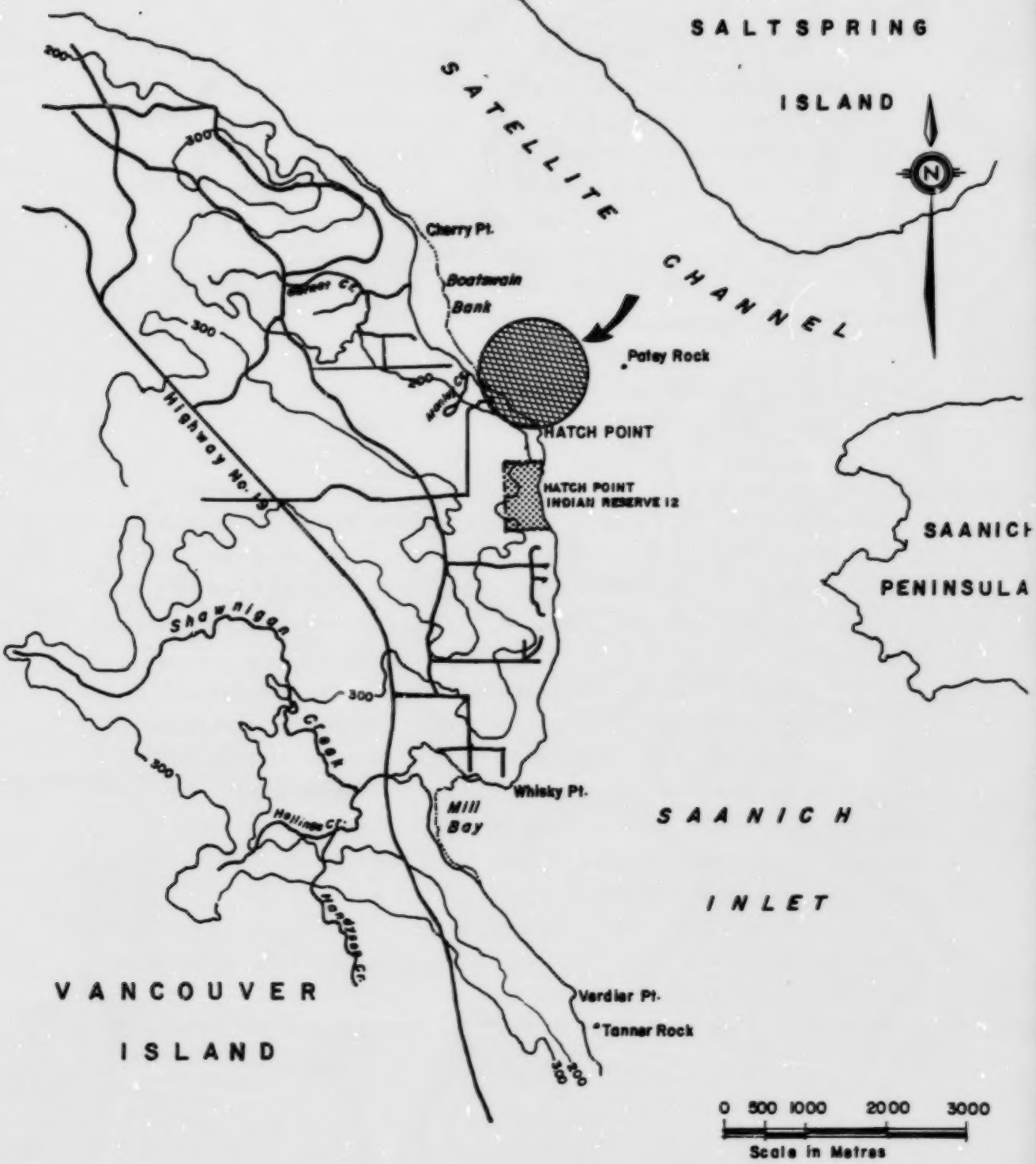


FIGURE 3 HATCH POINT SITE

PLATE 4 HATCH POINT SITE - Chevron Canada Development

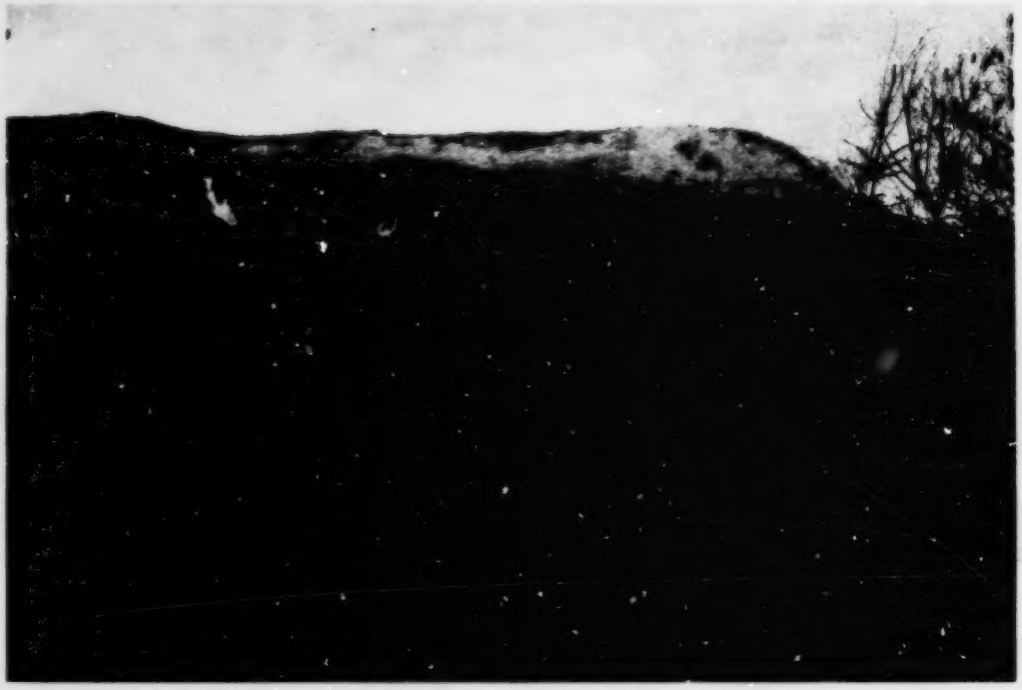


PLATE 5 HATCH POINT SITE - Copper Loading Facilities

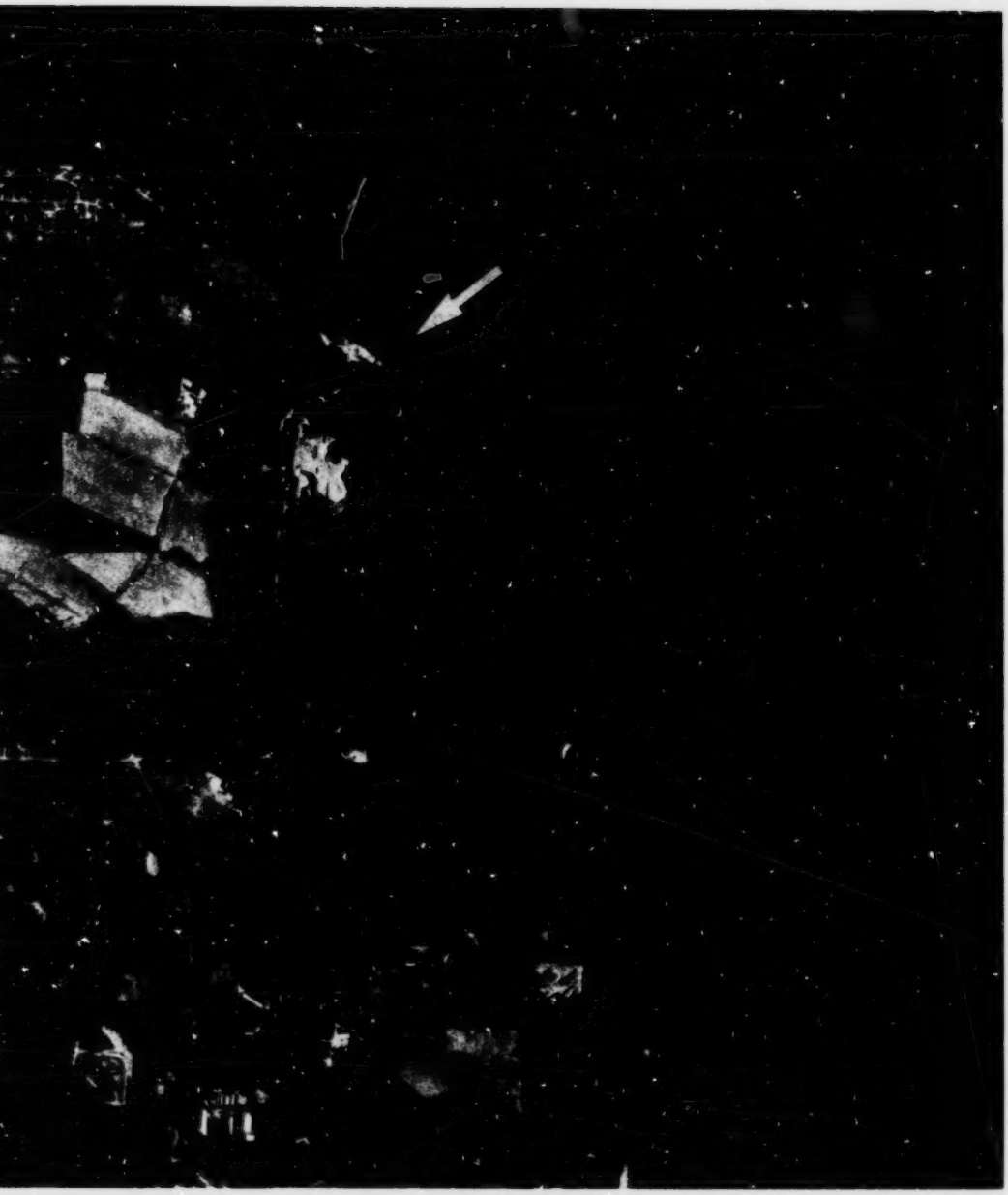


PLATE 6 AIRPHOTO OF HATCH POINT SITE
(15 BC 80078 100)

The Chevron Canada Ltd. facilities quite likely have pre-empted the use of the area for a coal terminal. Due to this possibility, the Hatch Point site was not investigated in any depth and no further map or text information on it has been included.

3.4 Kulleet Bay

This site is located on the Chemanus Indian Reserve, (Figure 4). There are no tidal current constraints and a breakwater would not be required. During strong easterly winds, barges may be prevented from berthing. Deep draft (150,000 DWT) ships would have to be berthed 200 m from shore. There is no direct road access from highway No. 19, nor is there a nearby access to rail. Plate 7 is a view of the Bay looking south-easterly.

Kulleet Bay is important for wintering and migratory waterfowl. Large numbers of scaup (2000), scoter (3000), and gulls (1025) have been observed there by B.C. Ministry of Environment biologists. Herring, groundfish and squid spawn there and oyster and clam beds are actively used. Killer whales have been observed migrating through Stuart Channel. There are several heritage sites along the coast of the bay. Some of the above features are shown in Figures 5 to 9.

The Canada Land Inventory waterfowl capability rating for Kulleet Bay is 3M, i.e., it may not be useful for waterfowl production but is important for wintering and migration. The recreation capability rating is 2 which means that it has a natural capability to engender and sustain high total annual use based on one or more recreational activities of an intensive nature. The southern part of the bay is rated 3 which means it can sustain moderately intensive use.

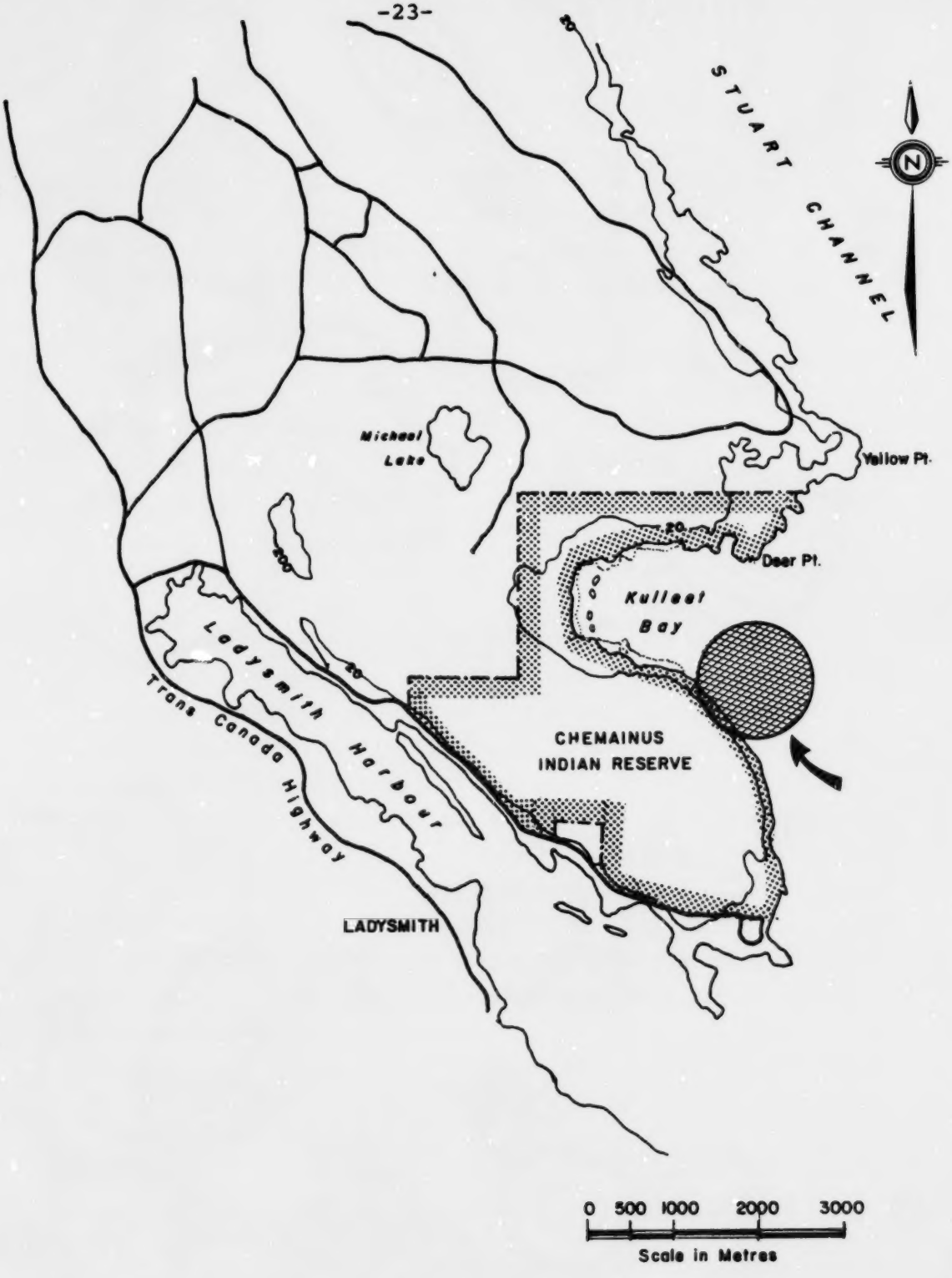


FIGURE 4 KULLEET BAY SITE

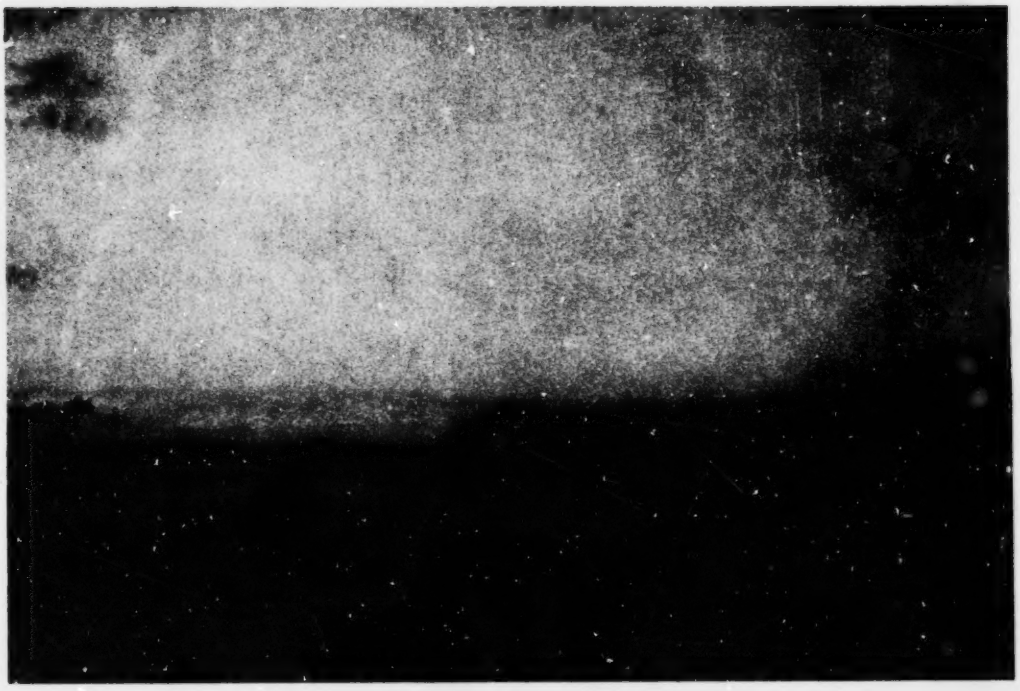


PLATE 7 KULLEET BAY

PLATE 8 AIRPHOTO OF KULLEET BAY
(15 BC 81009 203)

PLATE 9 AIRPHOTO OF COASTLINE SOUTH OF KULLEET BAY
(15 BC 81009 185)

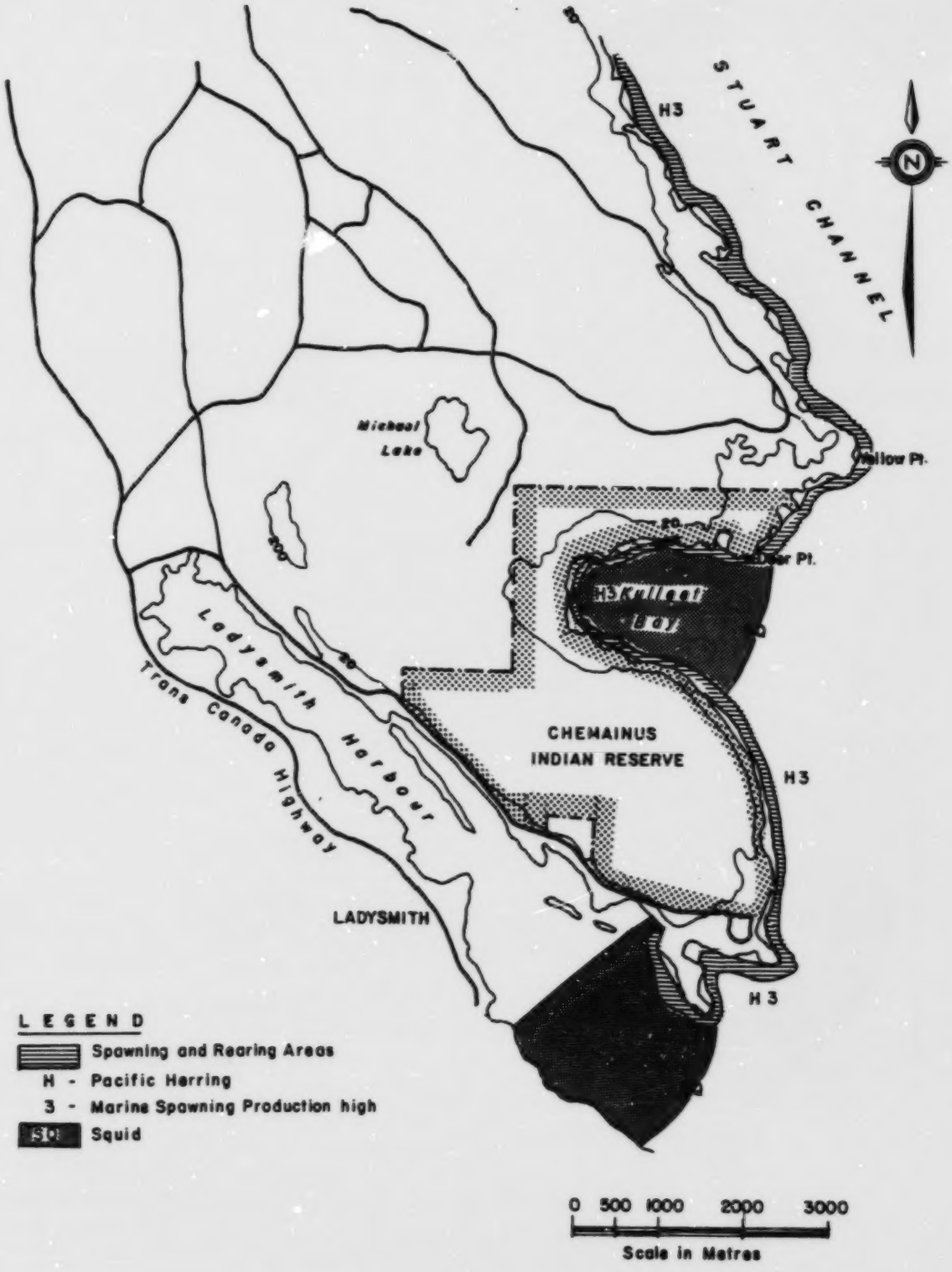
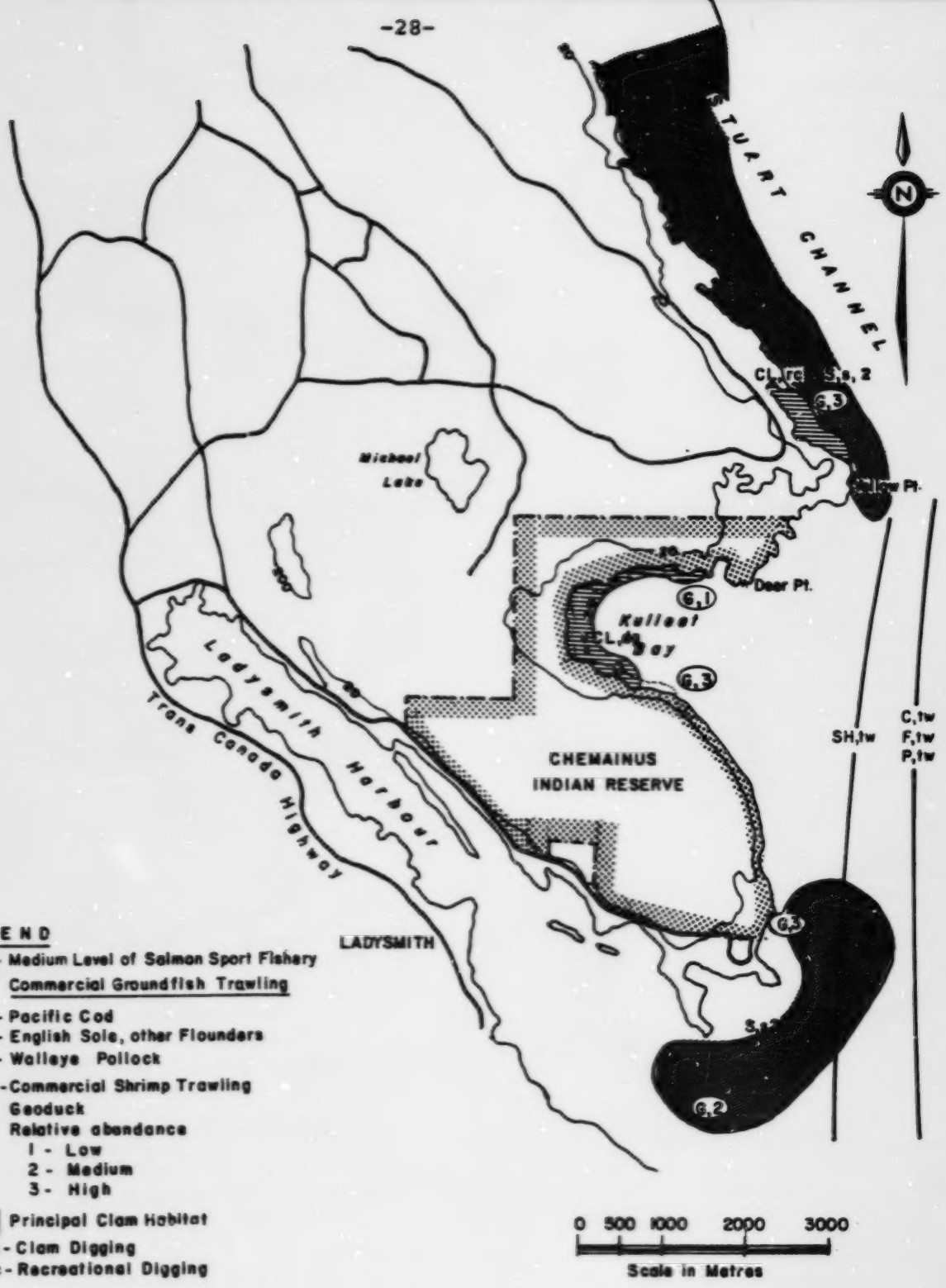


FIGURE 5 FISH SPAWNING AND REARING AREAS - KULLEET BAY SITE



LEGEND

- Medium Level of Salmon Sport Fishery

Commercial Groundfish Trawling

- C, tw - Pacific Cod
- F, tw - English Sole, other Flounders
- P, tw - Walleye Pollock
- SH, tw - Commercial Shrimp Trawling
- (6,2) - Geoduck
  Relative abundance
  - 1 - Low
  - 2 - Medium
  - 3 - High
- Principal Clam Habitat
- CL, dg - Clam Digging
  rc - Recreational Digging

FIGURE 6 FISH AND SHELLFISH RESOURCES - KULLEET BAY SITE

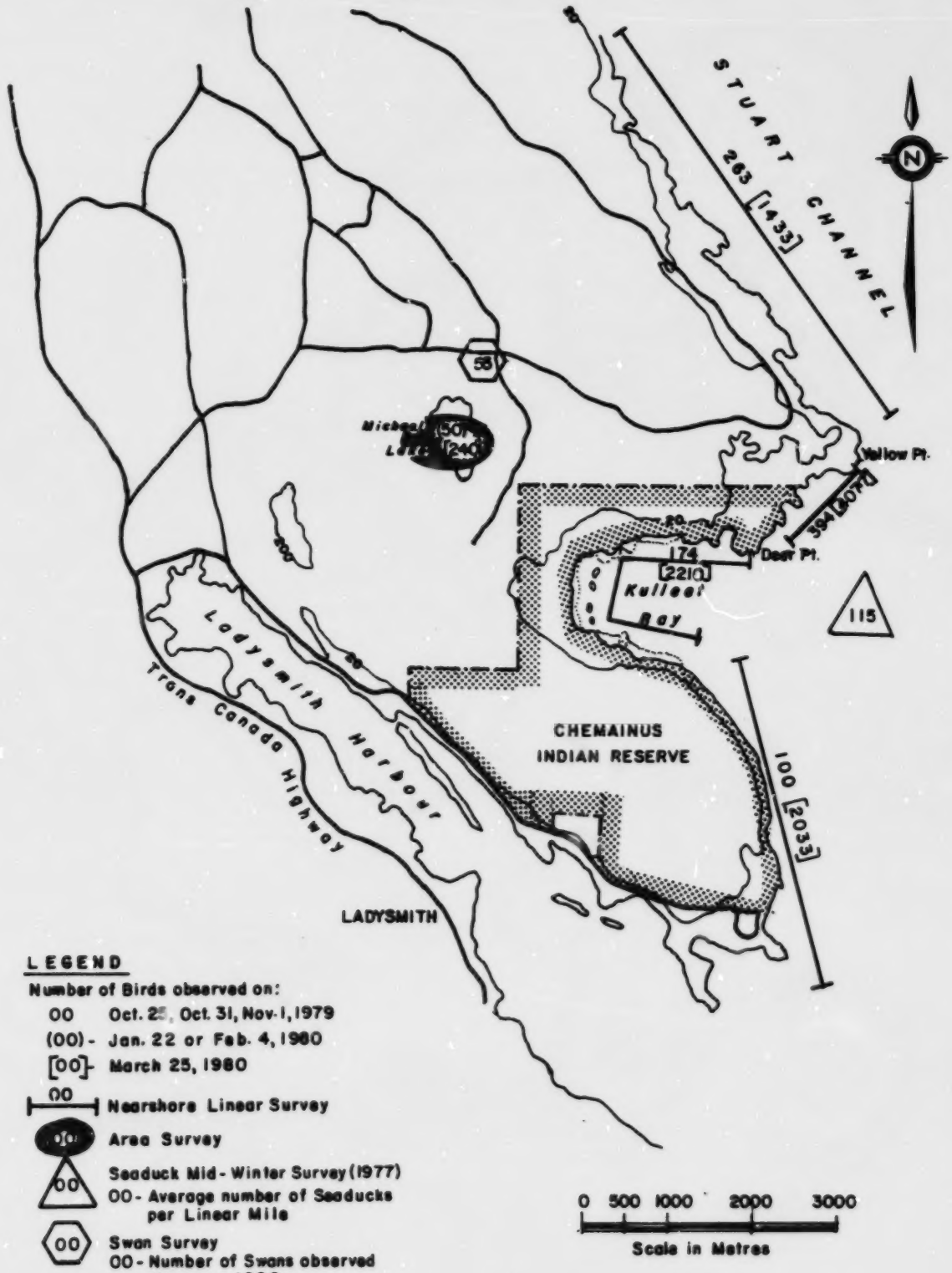


FIGURE 7 MARINE BIRDS - KULLEET BAY SITE

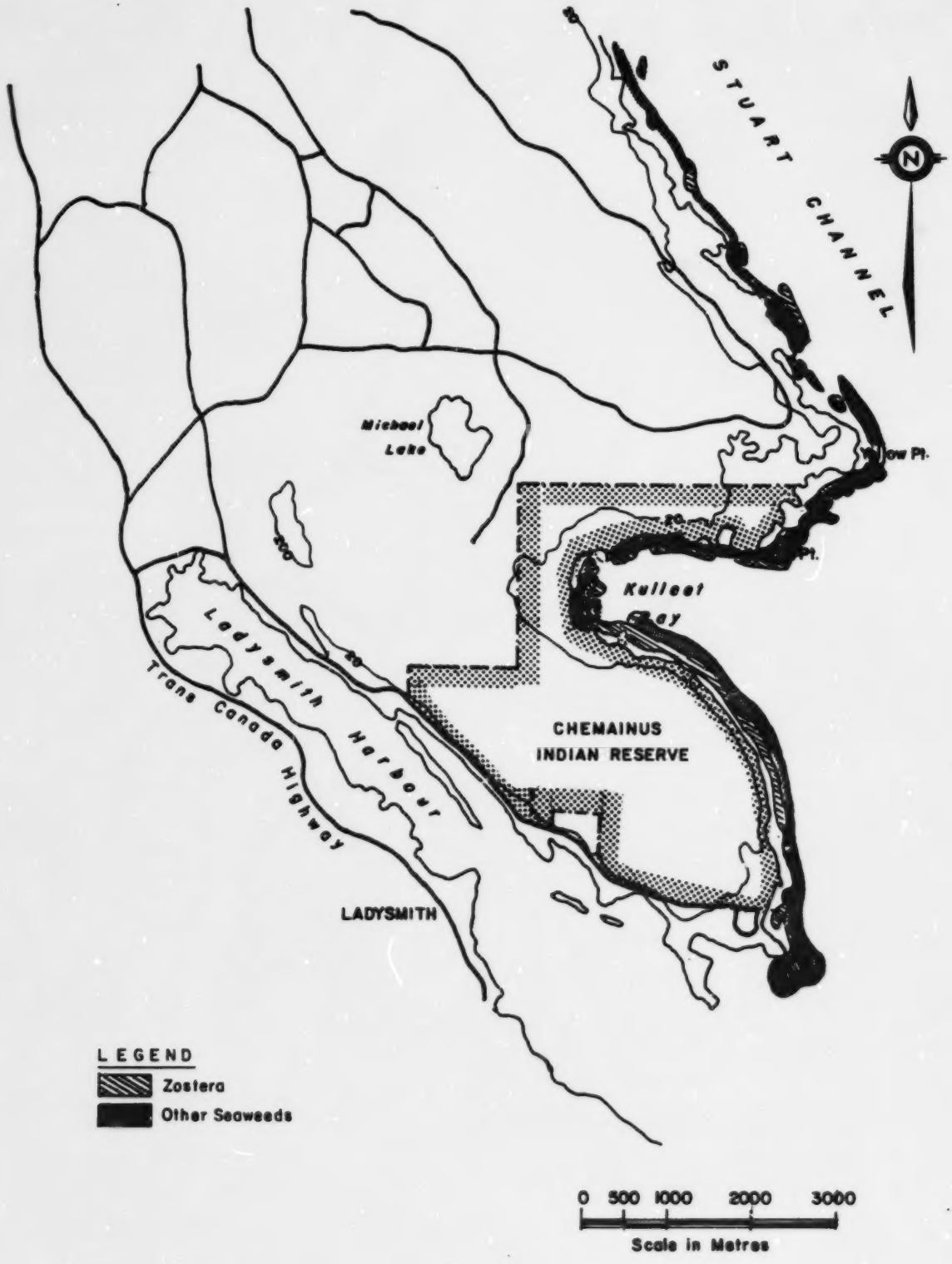


FIGURE 8 SEAWEEDS - KULLEET BAY SITE

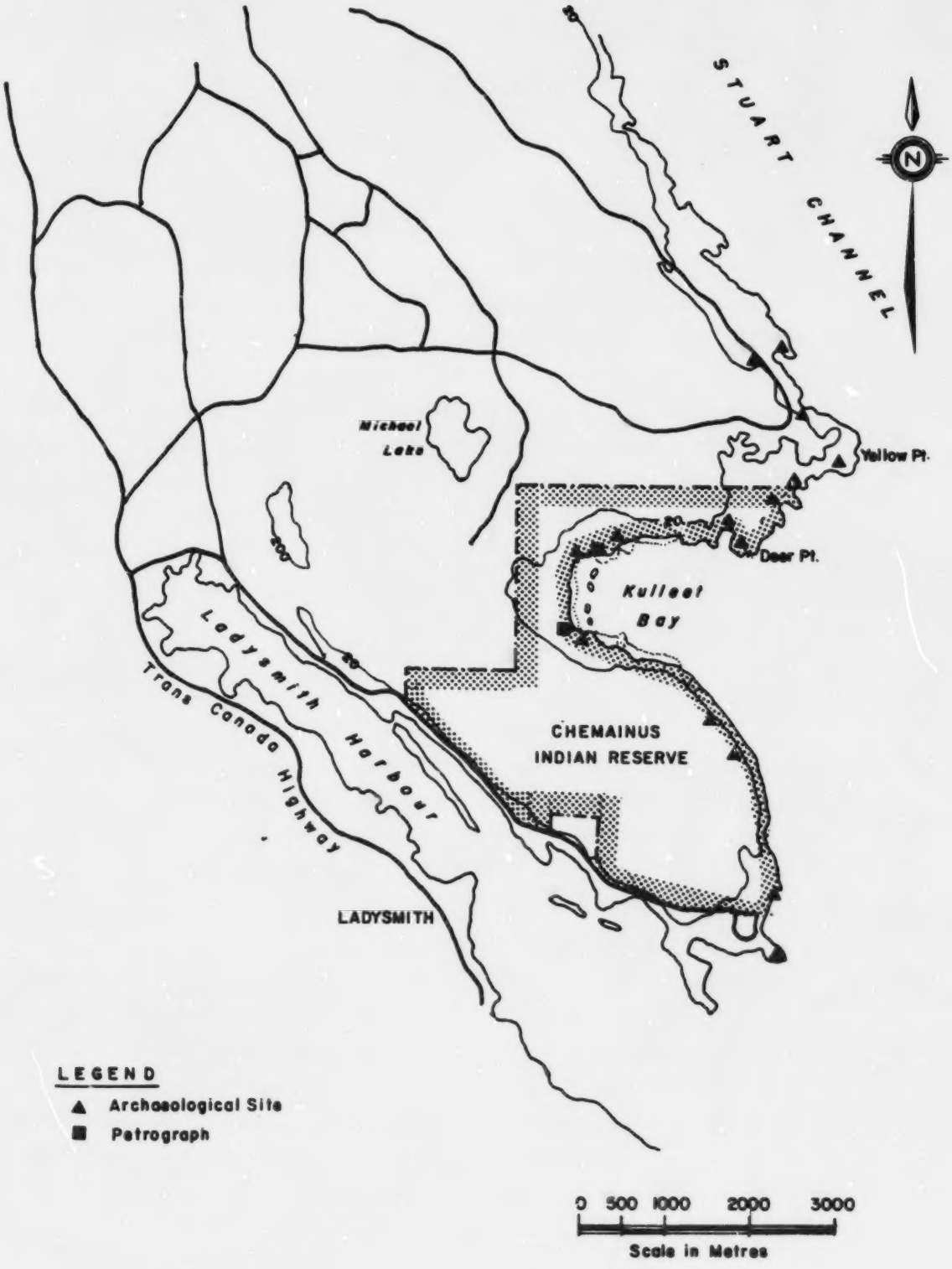


FIGURE 9 SPECIAL FEATURES - KULLEET BAY SITE

3.5 Union Bay

This site is adjacent to Highway No. 19, (Figure 1C), and not far from the railway. The winds are predominantly from the southeast and northwest. It is well sheltered from waves from all directions and would not require breakwater protection. Access, although difficult due to shoals on either side of a 500 m channel in Baynes Sound, would be from the south. Panamax sized vessels could be berthed 150 m from the high water mark and ships 150,000 DWT, 335 m away. Plate 10 is a view looking north easterly across the bay. The site was used for coal loading until 1959 and coal piles can be still seen at the site (Plate 11). An above ground pipeline fabrication yard for the regional sewage system is currently occupying some of the land at the site. The pipe is being kept on the railway bed that went to the previous coal loading facility.

Coal dusting problems could arise in the winter particularly because of the sites' exposed location and due to higher prevailing south-easterly winds. Although there is limited residential use nearby, the stockpiles would be clearly visable from the highway.

The site has poor drainage with the water table near the surface. Environmental features are shown on Figures 11 to 14. There are oysters, shrimp, and clams in this area. Baynes Sound is considered the most important oyster harvesting area in B.C.

Chum, coho, and steelhead use Hart Creek which flows through the site. Herring, sole, and flounder use the waters in the general area around Union Bay. Commercial harvesting of salmon, flounder, herring, shrimp, and clams occur in the area.

Killer whales migrate northwards through Baynes Channel. Considerable numbers of marine birds have been observed off Union Point. There is a provincial park branch reserve in the area as well as an archaeological site.

The Canada Land Inventory ungulate capacity rating for Union Bay is 3, which means the capability is moderately high, but productivity may

FIGURE 10 UNION BAY SITE

PLATE 10 UNION BAY

PLATE 11 UNION BAY SITE - Former Coal Stockpile

PLATE 12 AIRPHOTO OF UNION BAY
(30 BC 81005 117)

PLATE 13 AIRPHOTO OF UNION POINT
(30 BC 81005 093)

FIGURE 11 FISH SPAWNING AND REARING AREAS - UNION BAY SITE

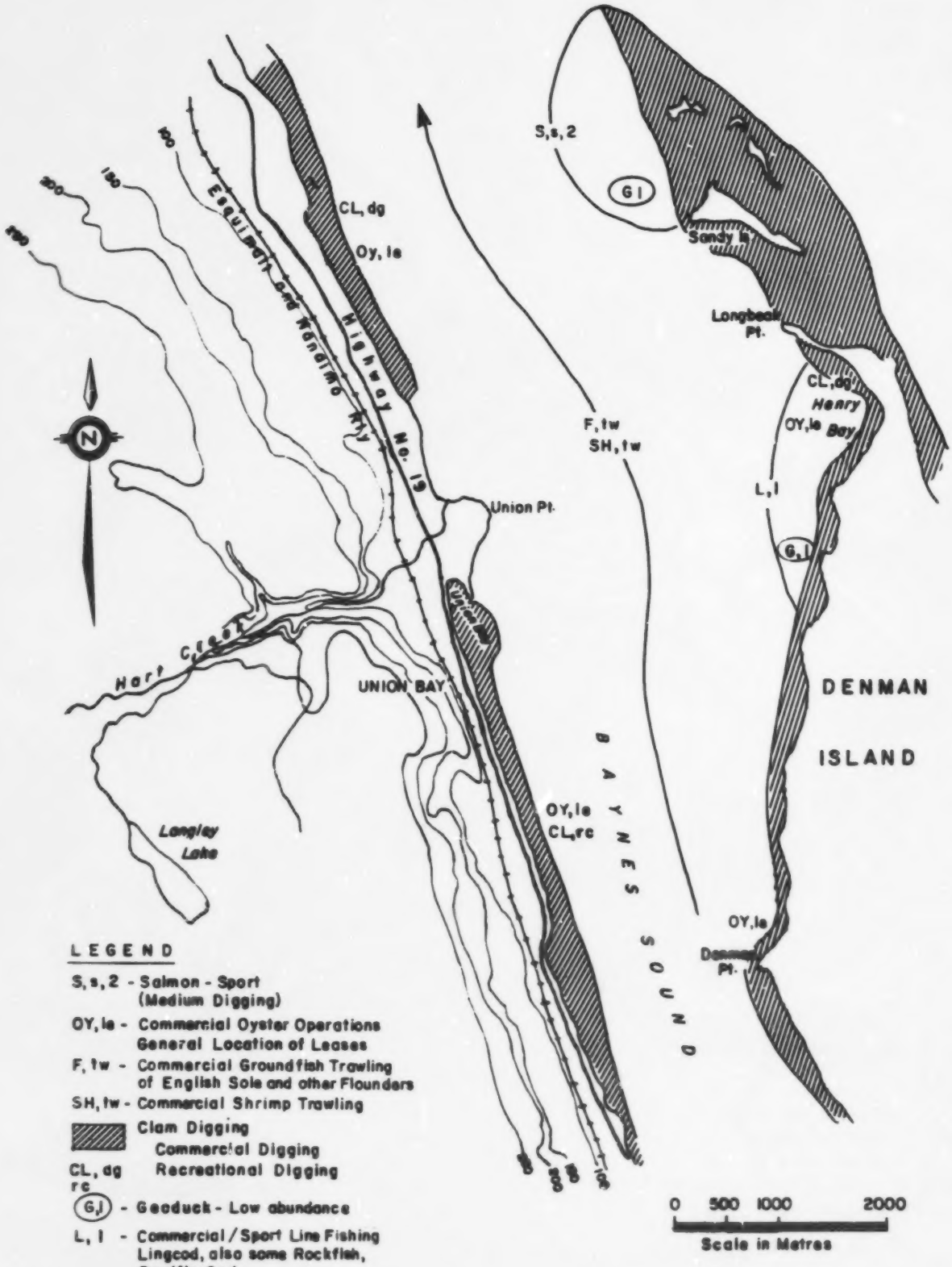


FIGURE 12 FISH AND SHELLFISH RESOURCES - UNION BAY SITE

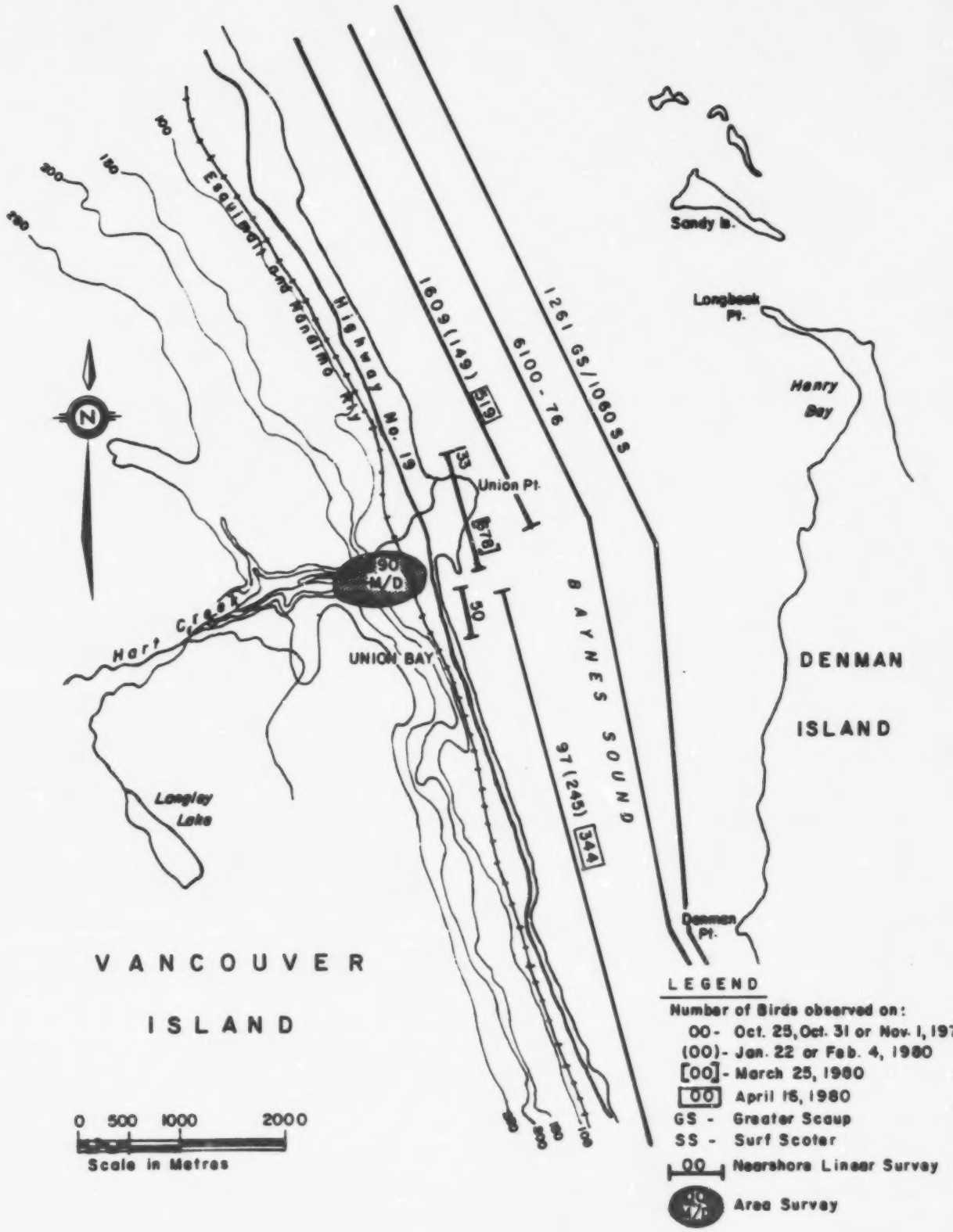


FIGURE 13 MARINE BIRDS - UNION BAY SITE

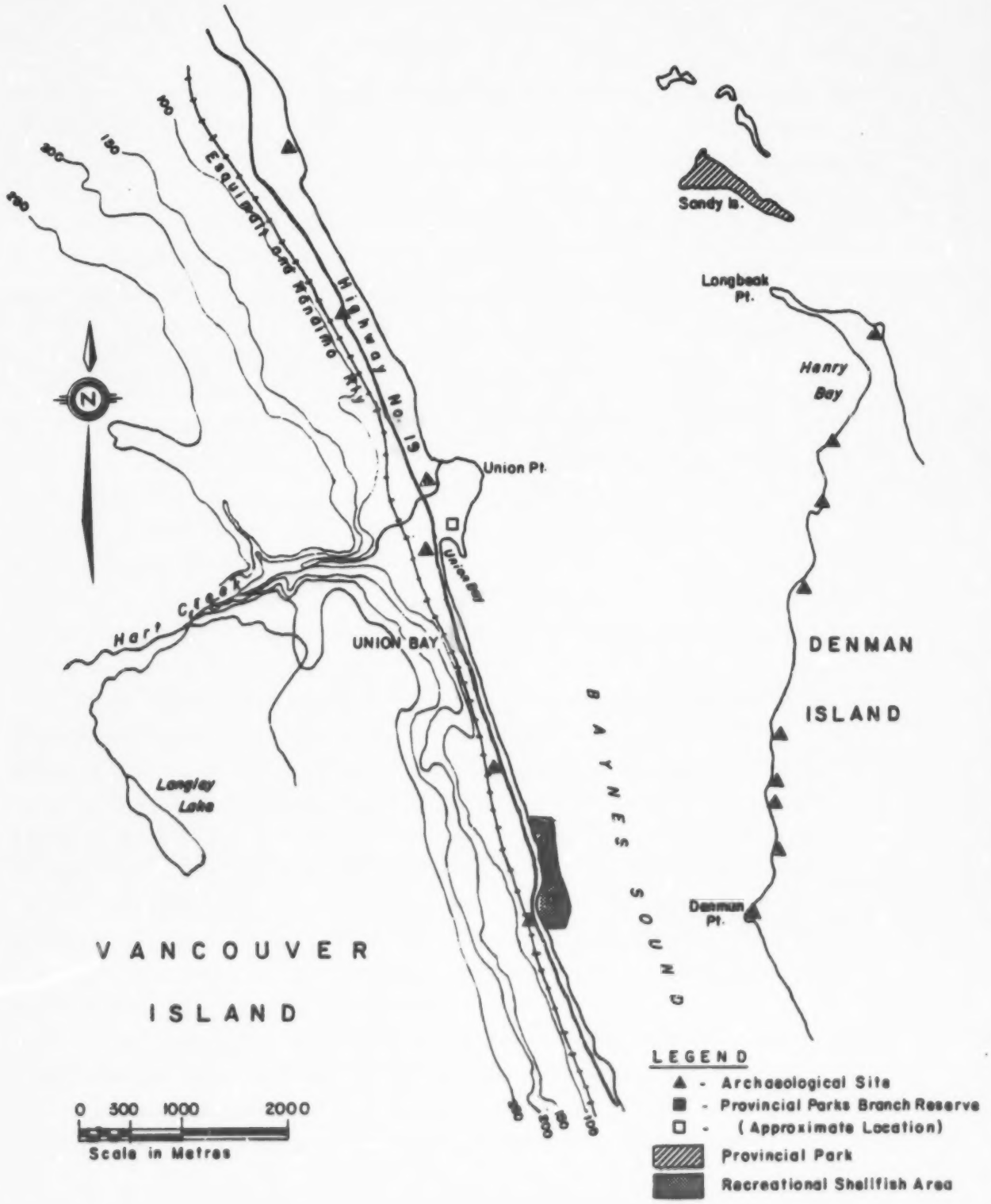


FIGURE 14 SPECIAL FEATURES - UNION BAY SITE

be reduced in some years. Slight limitations are due to characteristics of the land that affect the quality or quantity of habitat, or to climatic factors that limit the mobility of ungulates or the availabiliy of food or cover.

The recreation capability is also 3 meaning the land has a natural capability to engender and sustain moderately high total annual use based on intensive or moderately intensive activities.

The waterfowl capability is 3, not useful for production but important as wintering or migration areas.

3.6 Oyster Bay

Southern Oyster Bay, (see Figure 15 and Plates 14 and 15), has been reserved for future port growth (CBA, 1980).

Oyster Bay is 14.5 km south of Campbell River and had a 1975 populations of 1600. The main highway runs very close to the foreshore. There is an existing breakwater that could be used as a small protected harbour but which is used by MacMillan Bloedel for log booming. The site is approximately 30 km away from the railway.

Strong winds of over 30 knots occur from the east and southeast. Significant wave heights for a one in twenty year return period in the order of 3 m could create berthing and operating problems and consequently, a lengthy breakwater would be required. The water near the shore is shallow and less than 6 m for approximately 305 m from the high highwater mark and 18.3 m at approximately 550 m from the high highwater mark. Consequently the dock structure would have to be a considerable distance off-shore unless substantial dredging was undertaken. The ship and facilities would be highly visable from the highway. The recreational value in the Oyster Bay area is very high.

Figures 16 to 19 illustrate the environmental features in the area. Geoduck beds are found off-shore. The area around the site has extensive eelgrass communities with clams and shrimp present. There is a small stream in the area but its fisheries importance has not been

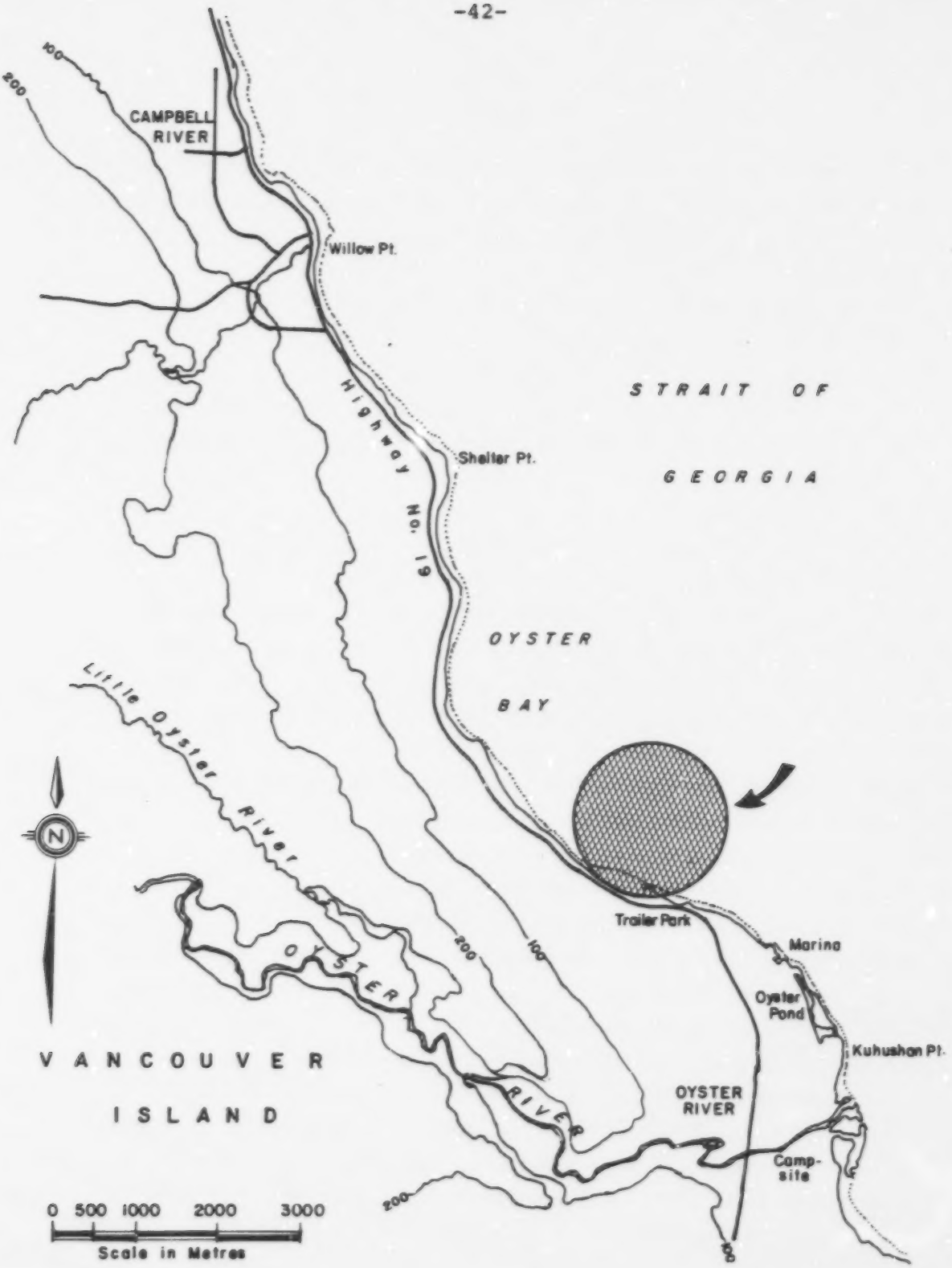


FIGURE 15 OYSTER BAY SITE

PLATE 14 OYSTER BAY

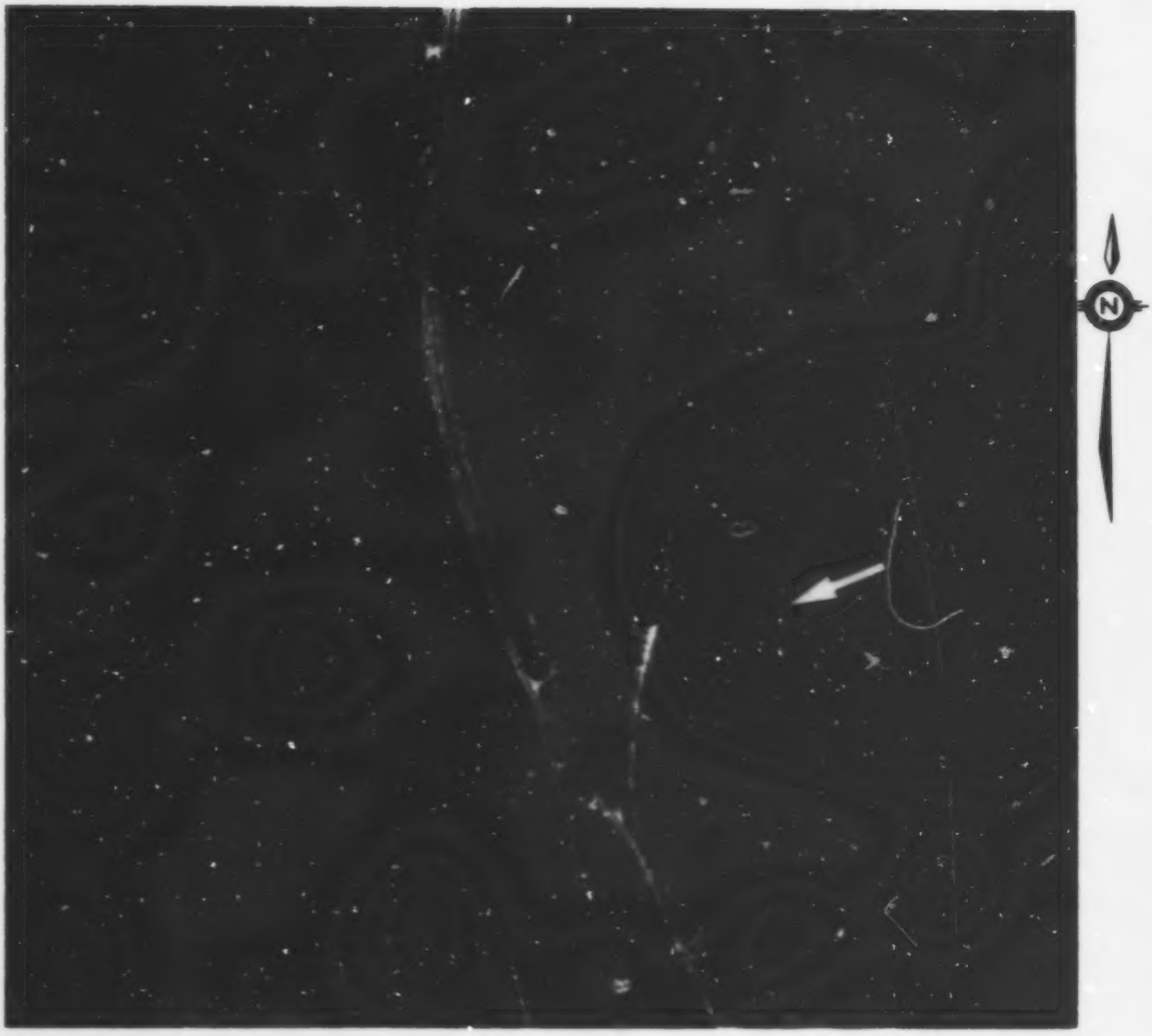


PLATE 15 AIRPHOTO OF OYSTER BAY
(30 BC 80020 165)

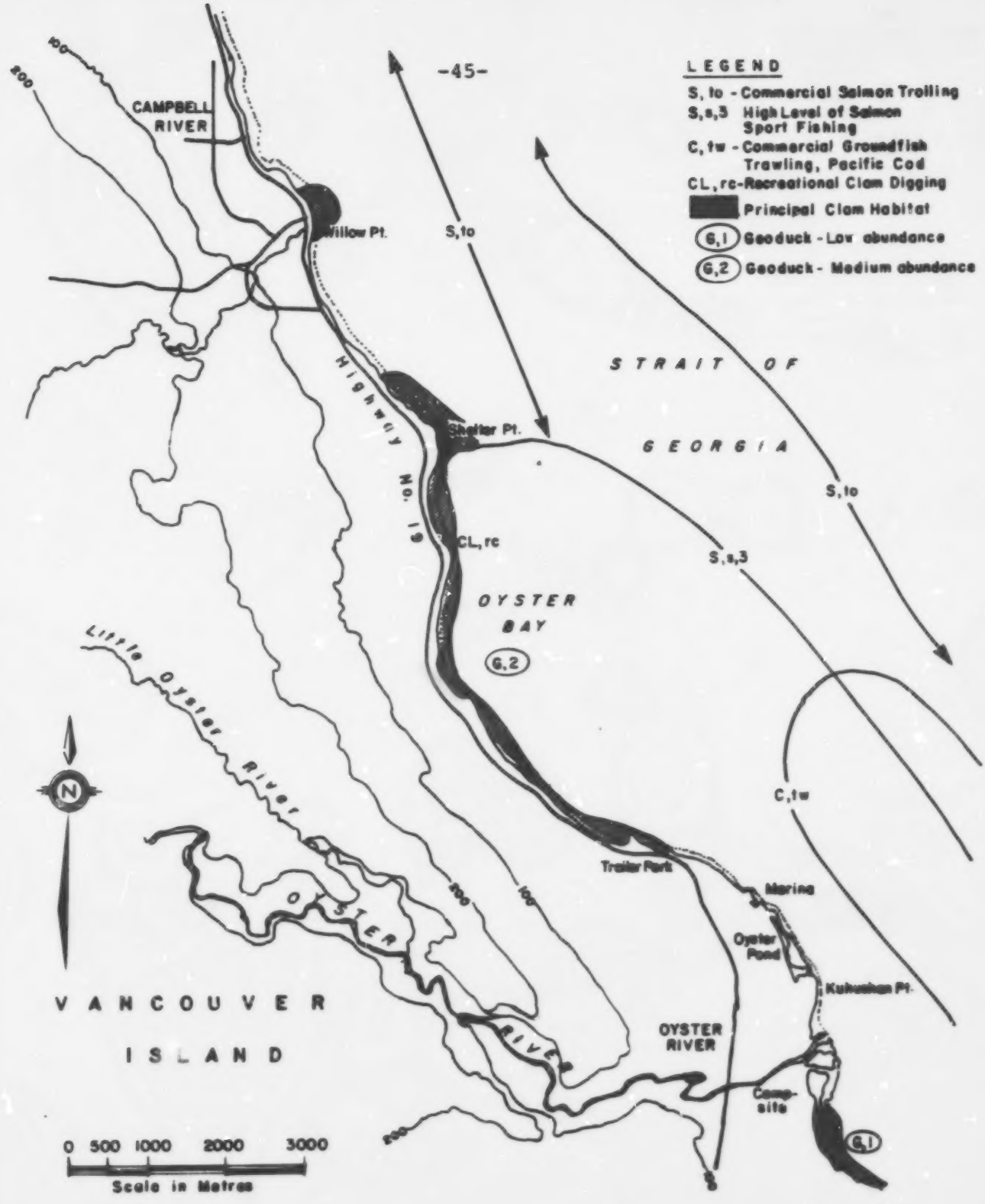


FIGURE 16 FISH AND SHELLFISH - OYSTER BAY SITE

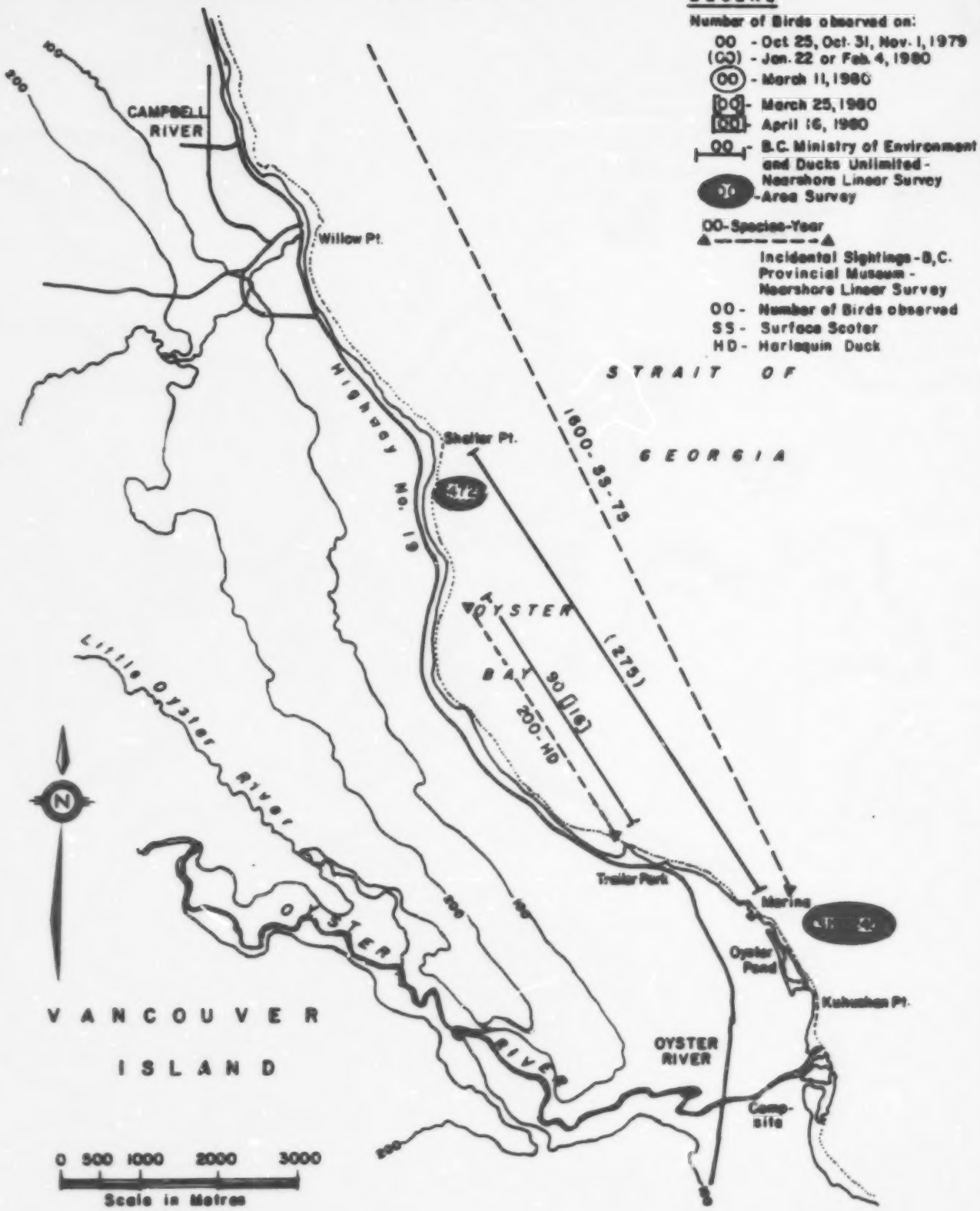


FIGURE 17 MARINE BIRDS - OYSTER BAY SITE

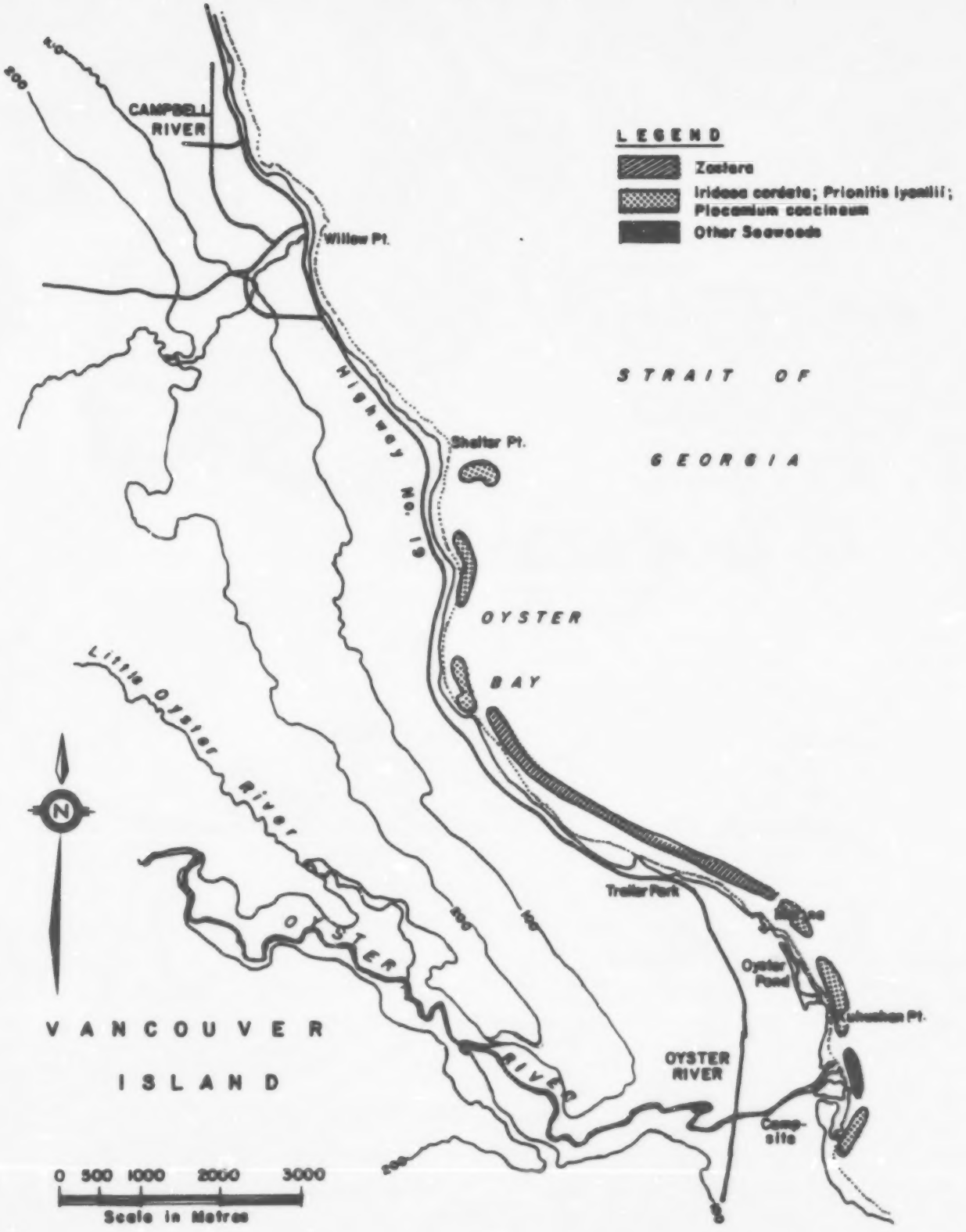


FIGURE 18 SEAWEED - OYSTER BAY SITE

FIGURE 19 SPECIAL FEATURES - OYSTER BAY SITE

established. There is a high level of sport salmon fishing that occurs in Georgia Strait east of the Bay. Commercial groundfish trawling and salmon trawling also occurs. Pacific Cod are abundant in the area and there are oyster beds along the entire coastline.

Waterfowl such as Harlequin duck, Oldsquaw, Mallards, geese, and scoter use the area. Great Blue Heron have also been observed in the area.

The Canada Land Inventory waterfowl capability rating is 7 for most of the Bay area and 3M for the southern part, i.e. severe limitations for production (7) and important for migration or wintering (3M).

The ungulate capability rating is 3, i.e., it has slight limitations for the production of ungulate.

The recreation capability rating is 1, i.e., it has a very high capability for outdoor recreation.

3.7 Middle Point

The site is approximately eight kilometers north of Campbell River. The nearest railhead is at Courtney, 50 km away. The point itself is a lava flow rock outcropping projecting 250 m from the shoreline (Figure 20 and Plates 16 and 17).

Offshore Warspite Rock is a navigational hazard (250 m) with eddies that are strong and variable. The tidal currents in the area are also strong (4-6 knots), turbulent and unpredictable. The navigational constraints of Discovery Passage limit Middle Point to being a barge loading facility. The Master Plan for Campbell River designates this area for port-oriented use.

This site is currently being proposed by a Quinsam Coal Company for a barge coal loading facility. Quinsam has submitted environmental documentation on the site to the B.C. Government as well as the Federal Departments of Environment and Fisheries and Oceans. Because of Quinsam's proposal, Middle Point is the most well documented of the eight sites investigated in this study. Readers interested in the details of these documents are referred to Quinsam Coal Limited (1982a and 1982b).

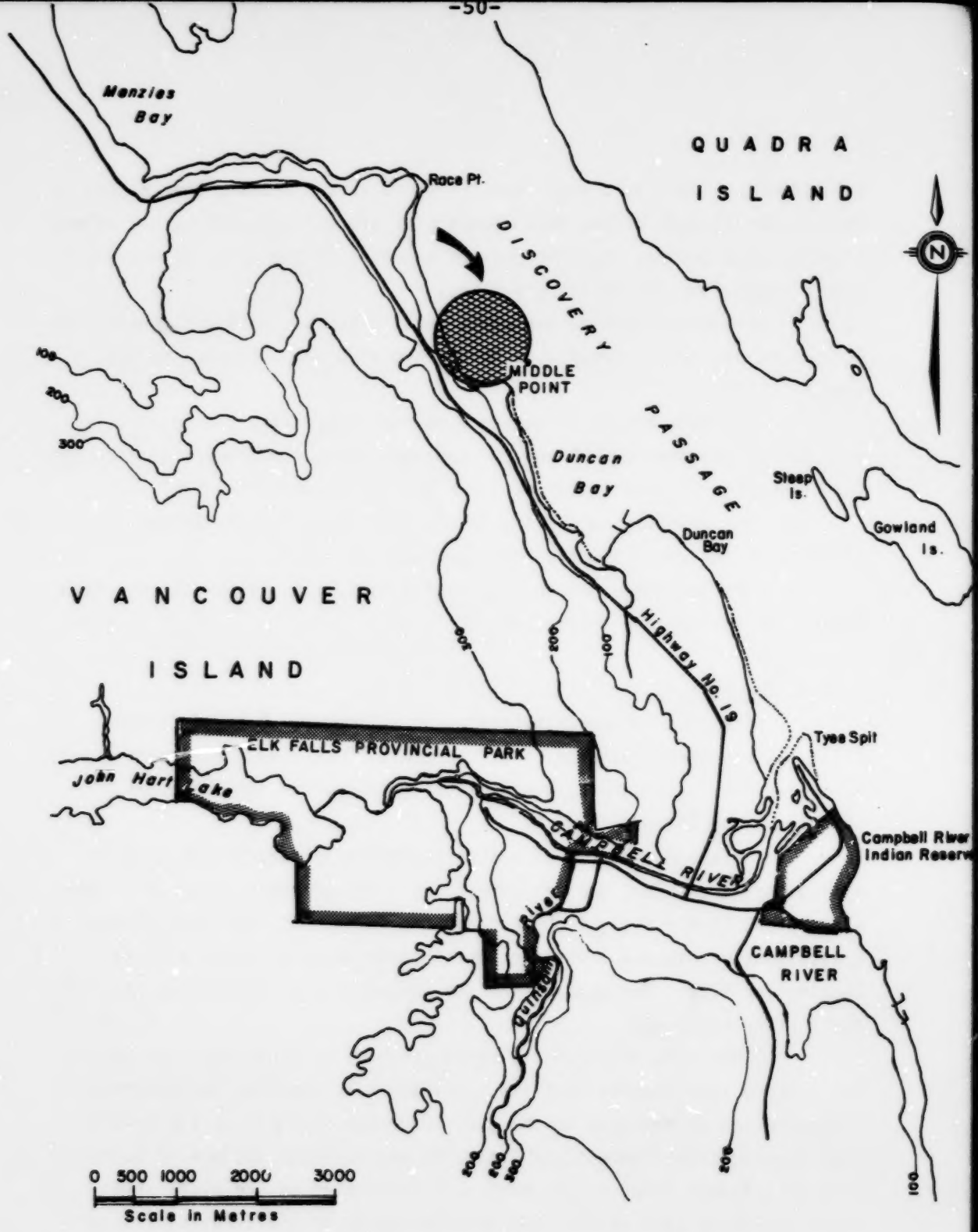


FIGURE 20 MIDDLE POINT SITE

PLATE 16 MIDDLE POINT

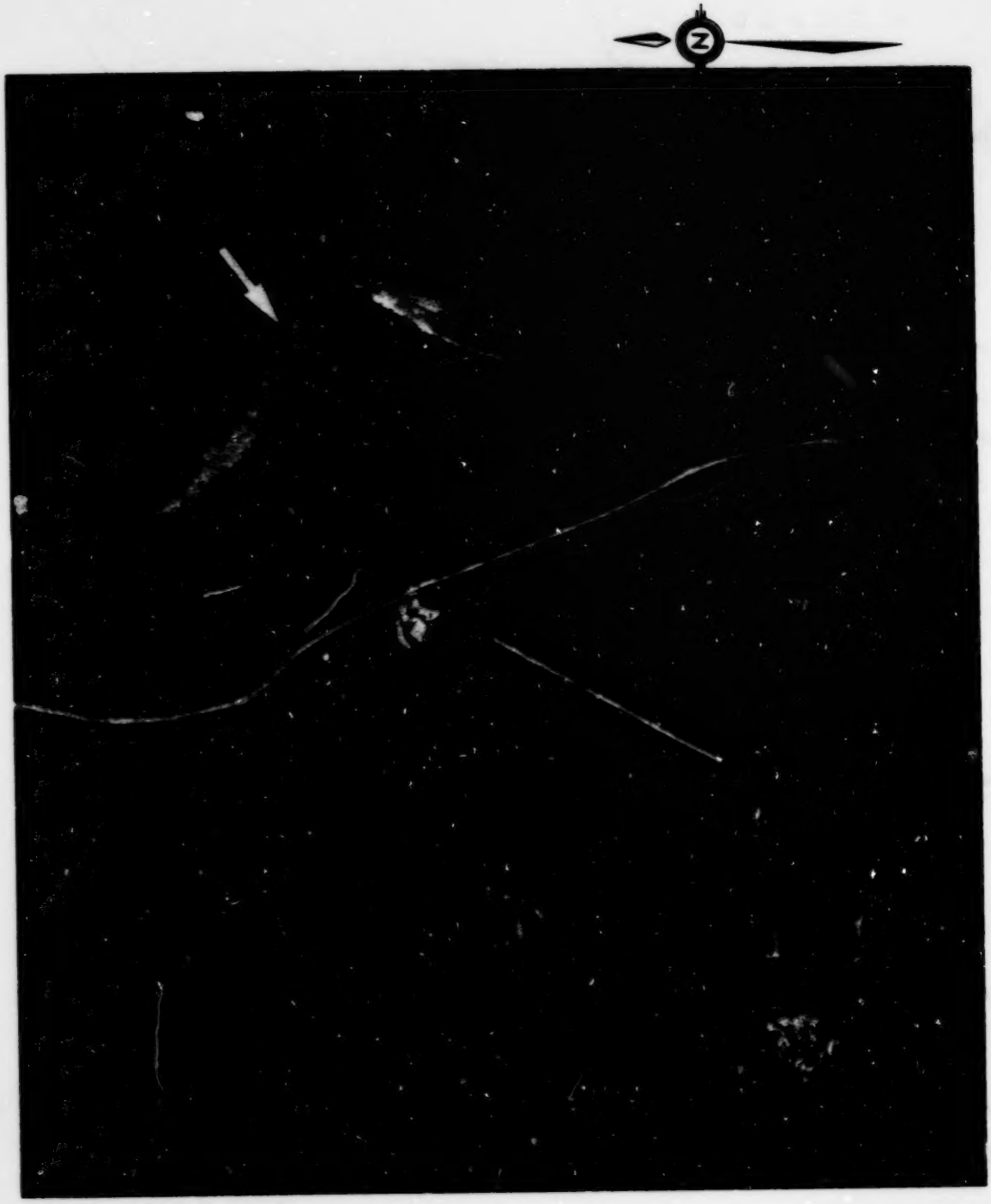


PLATE 17 AIRPHOTO OF MIDDLE POINT
(30 BC 80020 202)

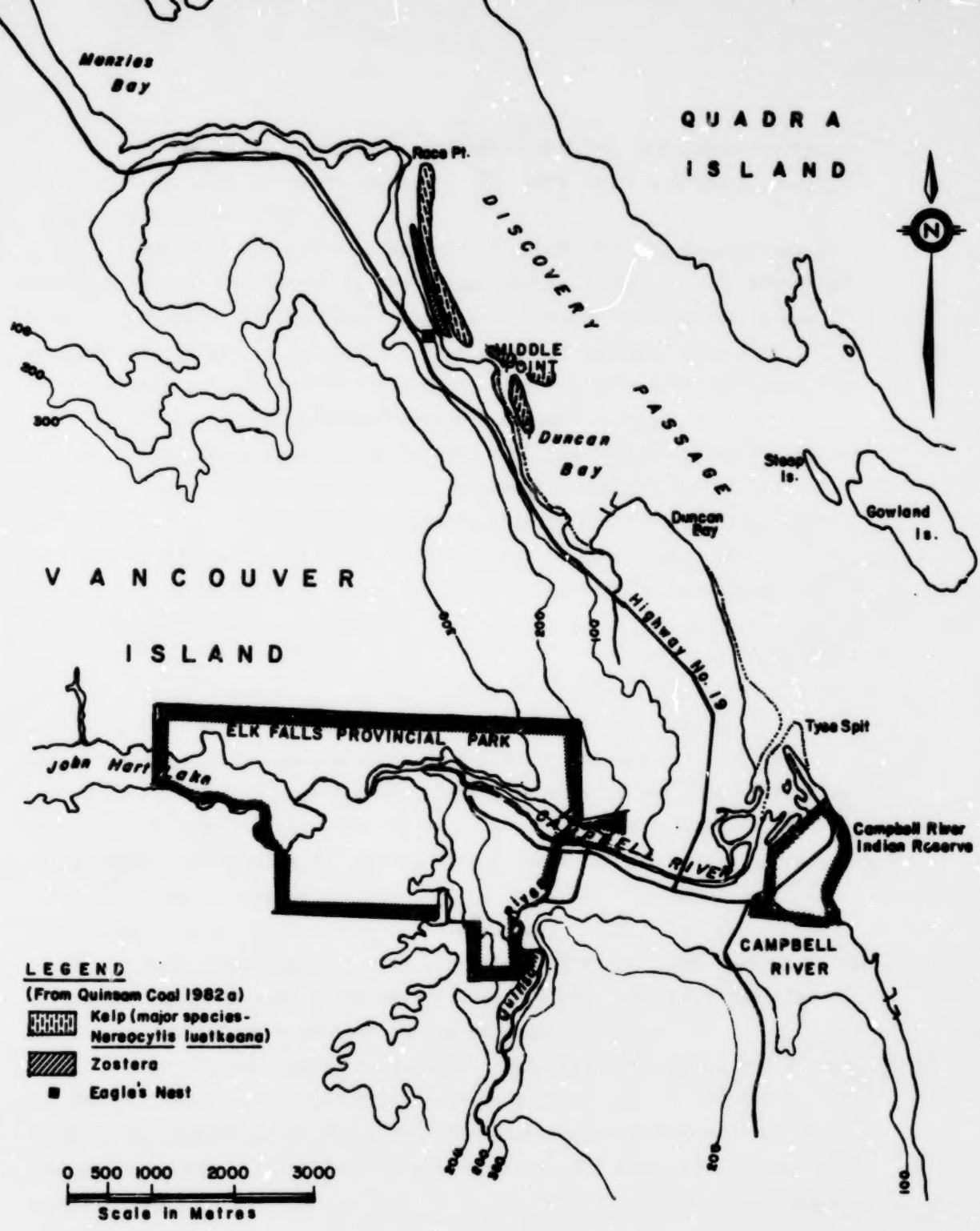


FIGURE 21 ENVIRONMENTAL FEATURES - MIDDLE POINT SITE

Strong tidal currents, a scoured foreshore, and sparse eelgrass beds limit the area as salmon habitat. The site is on a primary juvenile salmon migration corridor.

The Fish and Wildlife Branch has rated the waterfowl values as low. It is used mostly during the winter months. There are an estimated 5 to 7 bald eagles in the area. There are 34 mammalian species in the area and approximately 40 resident head of elk. Emergent kelp and eelgrass beds are sparse and confined to a narrow band near the shore.

Killer whales migrate through Discovery Passage.

The Canada Land Inventory waterfowl capability rating for Middle Point is class - 7, the land has such severe limitations that almost no waterfowl are produced. The ungulate capability rating is 3, i.e. the land has slight limitations to the production of ungulates. The recreational capability is rated as 4, i.e., the land has moderate capability for outdoor recreation.

3.8 Stamp Point

This site is on the west side of Port Alberni Harbour approximately two kilometers north of the Point (Figure 22). It is currently used for log sorting and booming (Plates 18 and 19). Extensive rock blasting and filling would be necessary to develop a loading facility there and access is also difficult. There are no wave or tidal current constraints and a breakwater would not be required. The winds are predominantly from the south or north northwest.

Deep draft vessels could not safely navigate Stamp Narrows. The site could berth Panamax sized vessels (55,000 DWT) but these vessels could only navigate the Narrows during the day.

The capital costs for a truck transportation concept are $7 million in comparison to $17 million for a similar concept for River Point. The capital costs for a rail transportation are $14 million in comparison to $44 million for a similar concept for River Point (Swan Wooster, 1980).

FIGURE 22 STAMP POINT SITE

PLATE 18 STAMP POINT (Across Water)

PLATE 19 AIRPHOTO OF STAMP POINT
(15 BC 79022 020)

Port Alberni has experienced a tsunami. During this event, in 1964, the water level was recorded 6.3 m above the low lowwater mark.

The major environmental impact of a coal loading facility at this site would be as a result of dredging and fill operations. Fugitive dust if uncontrolled could affect pulp and paper operations across the Inlet.

There are no spawning streams or estuaries on the site, however the Somass River enters the Alberni Inlet 3 km away and supports all 5 species of Pacific salmon, sea going Steelhead and Cutthroat trout. Port Alberni harbours a commercial fishing fleet and China Creek Marina 2 km to the west supports a large recreational fishery. Extensive environmental studies have been done on the Somass River estuary but none have been done for the Stamp Point site. It is one of the most important waterfowl sites on Vancouver Island and is known to have wintering trumpeter swans. In the Inlet, there has been severe forest industry effluent impact south to Holm Island. The current log booming use of the area has limited its use for any resource harvest use, although there may be some fisheries use of the area.

The Canada Land Inventory waterfowl capability rating for the site is class 7, i.e., it has such severe limitations that almost no waterfowl are produced. The ungulate capability is 3 and 3W, i.e., it has slight limitations to the production of ungulates and it is an area that is a winter range on which animals from surrounding areas depend. The recreation capability is rated class 5, i.e., it has moderately low capability for outdoor recreation.

3.9 River Point

This site is 15 km south of Port Alberni on the south side of the Franklin River estuary (Figure 23, Plate 20). It is on an alluvial fan and there is adequate space for a 200,000 tonne stockpile. There are no tidal current problems and it is relatively well protected from all

wave directions. A breakwater would not be required. Approximately 100 m offshore, the water is deep enough for ships displacing 16.8 m. The narrowness of the channel at River Point and wind could cause berthing problems for Panamax size or larger vessels.

As mentioned in Section 3.8, the costs for the River Point site are considerably more.

Franklin River is a salmon spawning river and the marsh at the mouth of the river is said to likely have significant numbers of wintering waterfowl (Swan Wooster, 1980).

The major environmental impact at River Point would be as a result of dredging and filling operations. Salmon pass through the area to the Somass estuary and could be affected by dredging operations.

In a Ministry of Environment paper (Hunter, et al, undated) on priorization of coastal wetlands the Franklin River estuary has a 2 out of 3 resource value for waterfowl, 0 for wildlife, 3 for fish and 2 for productivity.

The Canada Land Inventory ungulate capability rating for River Point is the same as Stamp Point 3 and 3W, i.e., slight limitations for ungulate production and winter range used by animals from surrounding areas. The waterfowl capability is 3M, i.e., the site is not useful for waterfowl production but is important for wintering or migration. The recreation capability is Class 4, i.e., it has a moderate capability for outdoor recreation.

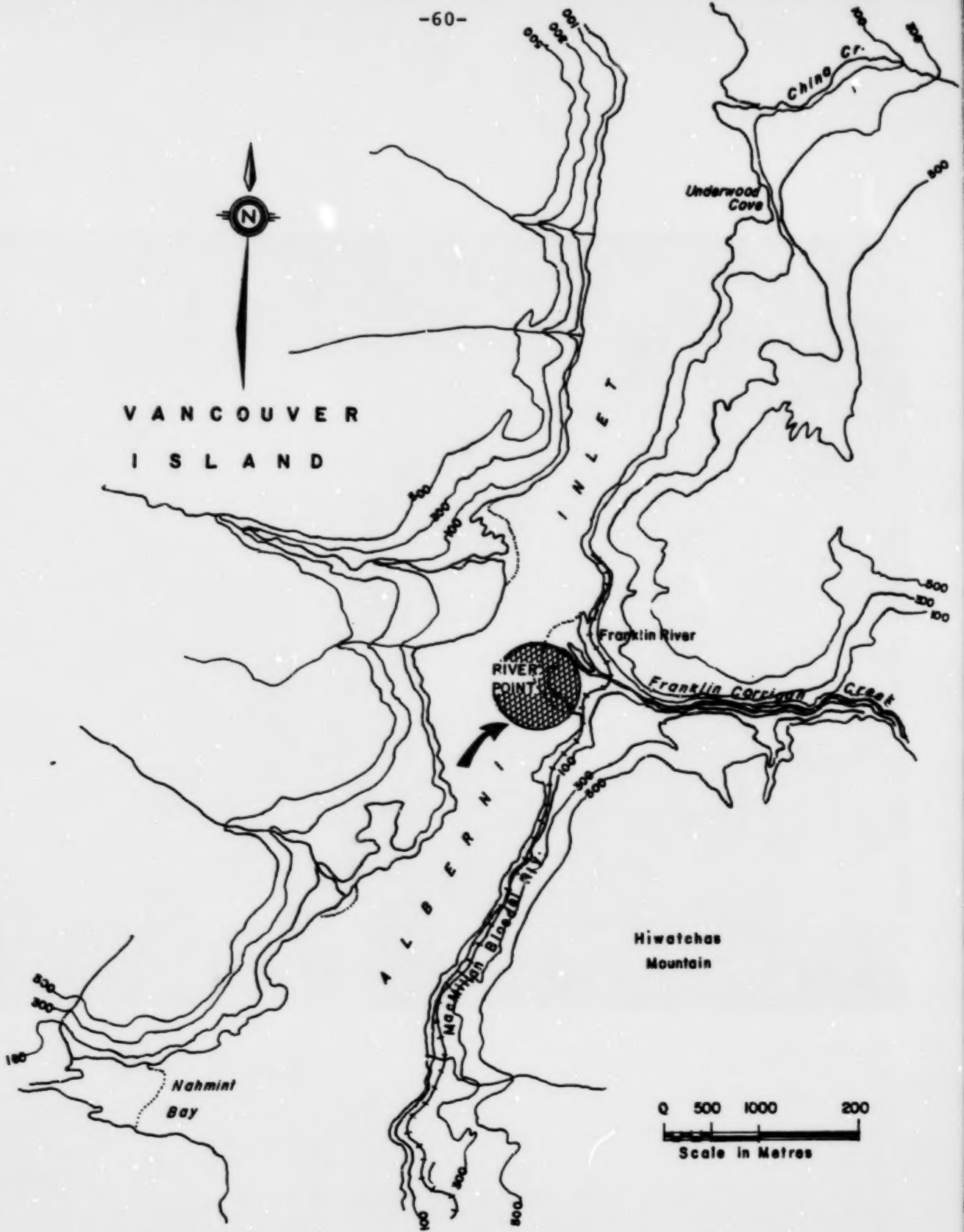


FIGURE 23 RIVER POINT SITE

PLATE 20 AIRPHOTO OF RIVER POINT
(15 BC 79022 032)

4.0 CONCLUSIONS

From the information reviewed no conclusion can be drawn on which site would be the best for a deep-sea coal loading terminal. Such a conclusion could only be made after a systematic site evaluation is made, and that exercise is beyond the terms of reference for this study. The pertinent points than can be made at this point are:

- Middle Point, due to navigational constraints, cannot be developed as a deep sea coal loading port and should be excluded from further investigation.

- The Chevron Canada Development at Hatch Point has probably pre-empted that site from future coal terminal development.

- The Port Alberni sites are marginal due to their distance from proposed or potential coal projects and the high cost to develop roads or rail access to the sites. River Point should possibly be excluded due to its estuarine location.

- None of the remaining sites are constraint free, all having some current or potential environmental or recreational value.

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6.0 APPENDIX

List of People Contacted

Bastaja, John	Regional District of Alberni and Clayoquot
Hunter, Roger	Surveys and Resource Mapping Branch, B.C. Ministry of Environment
Khan, Eman	B.C. Ministry of Transportation and Highways
Mc Inerney, John	Biology Department, University of Victoria
Millen, John	Environmental Protection Service
Romaine, Micheal	Lands Directorate, Environment Canada
Truscott, Joe	Assessment and Planning Branch, B.C. Minstry of Environment
Weibe, John	Assessment and Planning, Environment Canada

MAPS

Hydrographic Charts		Topographic Maps (1:50,000)
Bamberton	3441	92 B/12
Hatch Point	3441	92 B/12
Kulleet Bay	3443	92 G/4
Union Bay	3532	92 F/10
Oyster Bay	3591	92 F/14
Campbell River (Middle Point)	3565	92 K/3
Port Alberni (Stamp & River Point)	3672	92 F/2